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A profile from a secondary analysis of alcohol consumption among undergraduate college students

April Conley Tallant
University of Tennessee

To the Graduate Council:

I am submitting herewith a dissertation written by April Conley Tallant entitled "A profile from a secondary analysis of alcohol consumption among undergraduate college students." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Health and Human Sciences.

Susan M. Smith, Major Professor

We have read this dissertation and recommend its acceptance:

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Ernest W. Brewer

June D. Gorski

Gregory C. Petty

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A PROFILE FROM A SECONDARY ANALYSIS OF ALCOHOL CONSUMPTION AMONG UNDERGRADUATE COLLEGE STUDENTS

A Dissertation
Presented for the
Doctor of Philosophy
Degree
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April Conley Tallant
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ABSTRACT

The purpose of this study was to create a profile of four types of undergraduate alcohol drinkers enrolled in post-secondary institutions in the Southern United States. The study focused on non-frequent, frequent, non-binge and binge drinkers. The study also identified alcohol-related personal protective behaviors and analyzed the difference in alcohol-related health consequences reported by non-frequent, frequent, non-binge and binge drinkers who were undergraduate college students enrolled in higher education institutions in the Southern United States.

The research study was a secondary analysis of data using responses to the Spring 2006 National College Health Assessment. Select data were analyzed using chi-square tests and multivariate analysis of variance. Frequent drinkers were more likely to be male, White, and in his third or fourth years of undergraduate study. A non-frequent drinker was more likely to be female, non-White, and in her first or second undergraduate year. Binge drinkers were more likely to be male, White and in his fourth undergraduate year. Non-binge drinkers were more likely to be female, non-White and in her first year of undergraduate study.

Frequent drinkers reported using some alcohol-related personal protective behaviors than less often than non-frequent drinkers. Binge drinkers self-reported using some alcohol-related personal protective behaviors less often than non-binge drinkers. More frequent drinkers reported experiencing alcohol-related health consequences than non-frequent drinkers. Binge drinkers were more likely to report experiencing alcohol-related health consequences than non-binge drinkers.

Future research should continue to identify characteristics of frequent drinkers and binge drinkers. Programs to reduce frequent drinking and binge drinking should target male and White upper classmen. In addition, future research should examine different types of consequences and whether personal protective behaviors are effective in reducing the risk of such consequences. Further research should examine actual alcohol consumption, alcohol-related personal protective behaviors and health consequences rather than rely on recall.

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CHAPTER I

INTRODUCTION

The World Health Organization (WHO, 2005) recognizes the hazardous and harmful use of alcohol as a global health burden, naming it as the leading risk factor of death or injury for developing countries with low mortality rates and the third leading risk factor of death or injury for developed countries. Alcohol consumption has been reported to increase the risk of injury and death from both chronic diseases including cirrhosis of the liver and acute consequences including traffic crashes (Rehm, Gmel, Sempos, & Trevisan, 2003). The WHO reports that in 2000, alcohol use was responsible for 3.2% of total world deaths and 9.2% of all disability-adjusted life years lost in developed countries. Alcohol-related morbidity, disability and mortality negatively impacts health status in developing and developed countries (WHO).

The Centers for Disease Control and Prevention (CDC, 2004) reported that alcohol consumption was associated with negative health consequences in the United States. In 2001, 9.7 million Americans met the diagnostic criteria for alcohol abuse and 7.9 million Americans met the diagnostic criteria for alcohol dependence (Grant, Dawson, Stinson, Chou, Dufour, & Pickering, 2004). Alcohol use disorders have been found to lead to negative health consequences for individuals using alcohol and also to their loved ones and society at large (Grant et al.). Research by Mokdad, Marks, Stroup, and Gerberding (2004) found alcohol consumption to be the third leading cause of death in the United States in 2000. The Centers for Disease Control and Prevention (CDC, 2004) estimated there were 75,766 deaths in the United States attributed to alcohol in

2001. The CDC also reported that excessive alcohol use resulted in 2.3 million years of potential life lost in the United States in 2001.

Alcohol Use Behaviors Among United States Young Adults and College Students

High-risk alcohol drinking such as binge drinking among young adults has been reported to be a particular public health concern in the United States (Wechsler, Dowdall, Davenport, & Castillo, 1995). The CDC (2004) estimated that 6% of the alcohol-attributable deaths in 2001 were among persons under the age of 21. Research has shown that young adults have higher alcohol consumption and binge drinking rates compared to individuals in other age groups (Wechsler et al., 1995). In 2007 the Substance Abuse and Mental Health Services Administration reported results from the 2006 National Survey on Drug Use and Health (NSDUH) which is a national survey of substance use. This 2007 report showed peaks in current alcohol use in young adults ages 16-25. Of those responding to the 2006 NSDUH, 29.7% of 16 to 17 year olds, 51.6% of 18-20 year olds, and 68.6% of 21-25 year olds reported current alcohol use in 2006 (SAMHSA). Results of the study also demonstrated that young adults aged 18-25 reported the highest rate of binge drinking (consuming five or more drinks on the same occasion) of all groups surveyed. Thirty-six percent of respondents aged 18-20 and 46.1% of respondents aged 21-25 reported that they engaged in binge drinking (SAMHSA).

A study by O'Malley and Johnston in 2002 found that college students were both more likely to drink alcohol, and have "higher levels of use," also referred to as heavy drinking, than non-college students of the same age (p. 35). In prior research studies heavy drinking has often been referred to as binge drinking. In 1995 a study by

Wechsler, Dowdall, Davenport, and Rimm defined binge drinking using a gender-specific definition of four or more drinks in a row for females and five or more drinks in a row for males; or as five or more drinks on one occasion for both genders (Wechsler, Dowdall, Davenport, & Rimm, 1995). The Monitoring the Future Survey (MTF), a United States national annual survey of alcohol and drug use, defined binge drinking using the non-gender specific definition of five or more drinks on one occasion for both genders. Johnston, O'Malley, Bachman, and Schulenberg (2007) reported in the 2006 MTF that 40% of United States college students engaged in binge drinking (five or more drinks in a row at least once in the last two weeks) while 35% of non-college persons of the same age reported binge drinking. The 2006 NSDUH found similar results slightly less than half (45%) of United States college students aged 18-22 reported binge drinking in the past month, and slightly more than one-third (38.4%) of same-aged persons not enrolled in college reported binge drinking (SAMSHA, 2007).

A review of literature about alcohol consumption was conducted. In 1994, Wechsler, Davenport, Dowdall, Moeykens, and Castillo found that 44% of students sampled in the 1993 College Alcohol Study were binge drinkers. Wechsler, Lee, Kuo, Seibring, Nelson, and Lee (2002) examined results of the College Alcohol Study for the years 1993 to 2001. This study found that the overall rate of binge drinking remained stable over this time period. Researchers have also examined binging and frequency as joint indicators of high risk drinking. For example, Presley and Pimentel (2006) identified students who drank five or more drinks on one occasion in two weeks as heavy drinkers, and those heavy drinkers who drank three or more occasions in a week as heavy and frequent drinkers. Limited research that examined frequency as a single indicator of

drinking behavior was found in the review of literature. The researcher found one published study that examined frequent drinking in 1995, the National College Health Risk Behavior Survey. The National College Health Risk Behavior Survey identified current frequent use of alcohol as drinking 20 or more of 30 days. The study published in 1997 found that 4.2% of students (6.6% of males and 2.2% of females) self-reported frequent drinking (CDC, 1997).

Alcohol-related Personal Protective Behaviors Practiced by United States College Students

Martens, Taylor, Damann, Page, Mowry, and Cimini (2004) defined protective behavioral strategies as behaviors that alcohol drinkers used to minimize alcohol-related consequences. The NCHA (2003) listed ten alcohol-related personal protective behaviors. These behaviors included avoiding drinking games and limiting the number of alcoholic drinks consumed. Research published by Haines, Barker and Rice (2006) indicated that 73% of college students used at least one alcohol-related personal protective behavior to reduce their risk of experiencing harm. The Spring 2006 NCHA aggregate survey data of more than 94,000 United States college students indicated that 96.9% of college students reported usually or always using personal protective behaviors when drinking alcohol. The behaviors included 65.1% of respondents who reported keeping track of the number of drinks they had, 75.3% who reported using a designated driver, and 79.0% who reported eating before and/or during drinking (ACHA, 2006). Researchers have found that college student self-reports of using personal protective behaviors were associated with less alcohol-related harm (Haines et al., 2006; Delva, Smith, Howell, Harrison, Wilke, & Jackson, 2004).

Alcohol-related Consequences Experienced by United States College Students

A review of research by Perkins (2002) found studies that concluded college student alcohol use was associated with the occurrence of numerous negative consequences. Hingson, Heeren, Winter, and Wechsler (2005) estimated 1,248 of alcohol-related traffic deaths among 18-24 year olds were college students in 1998. Their study found an estimated 1,349 alcohol-related traffic deaths among college students in this age range in 2001 (Hingson et al.). Hingson et al. also reported that in 1998 and 2001, 327 and 368 college students died from alcohol-related non-traffic unintentional injuries, respectively. Wechsler, Lee, Kuo, Seibring, Nelson, and Lee (2002) reported that in the nationally representative 2001 College Alcohol Study, 10.7% of current college student past year alcohol-users surveyed reported damaging property, and 21.3% of respondents reported engaging in unplanned sexual practices. In this study, 29.0% of respondents reported driving after drinking , 12.8% of current college student alcohol-users reported getting hurt or injured, and 0.8% reported they experienced an overdose that required medical treatment (Wechsler et al.). Siebert, Wilke, Delva, Smith, and Howell (2003) reported in their study of college students enrolled at a public southeastern university, that 7.5% of respondents reported being involved in a fight, 6% had injured another person, and 25.4 % had physically injured themselves as a result of their drinking. Findings from these research studies have documented alcohol-related consequences associated with college student alcohol consumption.

Statement of the Problem

Perkins (2002) stated, "…the problems generated by student misuse of alcohol continue to present a major health hazard and social problem for higher education

communities and for society at large (p. 92)." The purpose of the research study was to create a profile of and identify the self-reported alcohol-related health consequences reported by non-frequent, frequent, non-binge and binge undergraduate alcohol drinkers enrolled in post-secondary institutions in the Southern United States. The differences between the alcohol-related personal protective behaviors reported by non-frequent, frequent, non-binge and binge drinkers who were enrolled as undergraduate college students in higher education institutions in the Southern United States were also analyzed. College health professionals in the Southern United States, including clinicians, health professors and health educators who work to reduce detrimental alcohol-related health consequences can use findings from the research study to prepare targeted alcohol prevention programs.

Purpose

The purpose of this research study was to create a profile of four types of undergraduate alcohol drinkers enrolled in post-secondary institutions in the Southern United States. The study focused on non-frequent, frequent, non-binge and binge drinkers. The study also identified alcohol-related personal protective behaviors and analyzed the difference in alcohol-related health consequences reported by non-frequent, frequent, non-binge and binge drinkers who were undergraduate college students enrolled in higher education institutions in the Southern United States.

Research Questions

The researcher formulated research questions in order to meet the purpose of the study. There were six primary research questions addressed in the study:

1. What is the relationship between the frequency of self-reported alcohol

drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?

2. What is the relationship between the self-reported binge alcohol drinking by college student in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?

3. Are there significant differences between the frequency of self-reported alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?

4. Are there significant differences between self-reported binge alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?

5. What is the relationship between the frequency of self-reported alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?

6. What is the relationship between self-reported binge alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?

Assumptions

The following assumptions were made for the research study:

1. Students accurately self-reported their alcohol consumption behaviors, alcohol-related personal protective behaviors, and alcohol-related health consequences on the 2006 NCHA.

2. The educational institutions accurately self-reported that their institution used random sampling methods to administer the 2006 NCHA.

Delimitations

Delimitations are boundaries set by the researcher. The following were delimitations of the research study:

1. The data used in the secondary analysis for the study was delimited to data related to alcohol use and behaviors reported by students collected from higher education institutions who self-selected to participate in the NCHA during the Spring semester of 2006.

2. The study was delimited to undergraduate students whose responses were included in the NCHA Spring 2006 database and who were enrolled in institutions of higher education located in the Southern states of Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia, as well as the District of Columbia.

Limitations

In research, some limitations are beyond the control of the researcher. The following were limitations of the research study:

1. The secondary research selected for use in this study was limited because it only included secondary data collected from educational institutions that self-selected to participate in the NCHA during the Spring 2006 semester.

2. The study was limited in that it relied on self-reported alcohol consumption from a secondary data source.

Definitions

The researcher defined terms as they relate to the research study. The following terms were operationally defined and used in the research study:

1. *Alcohol-related health consequences* are outcomes that occur as a result of drinking alcohol. The health consequences on the NCHA are: Physically injured self; physically injured another person; been involved in a fight; did something you later regretted, forgot where you were or what you did; had someone use force or threat of force to have sex with you; had unprotected sex; driving after drinking any alcohol; and driving after having five or more drinks.

2. *Alcohol-related personal protective behaviors* are measures taken to reduce one's risks while drinking alcohol. The alcohol-related personal protective behaviors listed on the NCHA are: Alternate non-alcoholic with alcoholic beverages; determine, in advance, not to exceed a set number of drinks; choose not to drink alcohol; use a designated driver; eat before and/or during drinking; have a friend let you know when you've had enough; keep track of how many drinks you were having; pace your drinks to 1 or fewer per hour; avoid drinking games; and drink an alcohol look-alike (non-alcoholic beer, punch etc.).

3. *Alcoholic drinks* are defined on the NCHA as 12 ounces of beer, 4 ounces of wine, a shot of liquor or a mixed drink.

4. A *binge drinker* was operationally defined for the purpose of the study to describe a respondent who reported having five or more alcoholic drinks the last time one socialized, *and/or* having five or more alcoholic drinks at a sitting at least one time in the last two weeks.

5. *College student*s are pupils enrolled in United States post-secondary institutions of higher education.

6. *Drinking* refers to the act of consuming alcohol.

7. *Drinking type* is the manner in which students consume alcohol, including frequent drinking, non-frequent drinking, binge drinking, and non-binge drinking.

8. A *frequent drinker* was operationally defined for the purpose of the study to describe a respondent who reported using alcohol on six or more days in the last 30 days *and/or* drinking the same amount of alcohol as one indicated they did the last time they socialized, within the last two weeks, on three or more occasions.

9. *High-risk alcohol use* describes types of drinking that can potentially lead to harm, including frequent drinking, binge drinking, as well as a combination of both frequent and binge drinking.

10. A *Non-binge drinker* was operationally defined for the purpose of the study to describe a respondent who reported having less than five alcoholic drinks the last time one socialized, *and* having no reports of consuming five or more alcoholic drinks at a sitting in the last two weeks.

11. A *Non-frequent drinker* was operationally defined for the purpose of the study to describe respondents who reported using alcohol on less than six days in the last 30 days *and* drinking the same amount of alcohol as one indicated they did the last time they socialized, within the last two weeks, on less than three occasions.

12. *Race* is how students described themselves on the NCHA, limited on the NCHA to: White not Hispanic (includes Middle Eastern); Black not Hispanic; Hispanic or Latino; Asian or Pacific Islander; American Indian or Alaskan Native; or Other. The researcher used two broad categories, White (any respondent who chose White) and non-White (any respondent who chose a race other than White) for statistical analyses.

13. *South* is a region of the United States limited to the following as classified by the ACHA: Alabama, Arkansas, Delaware, , Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia and the District of Columbia.

14. *Undergraduate students* are pupils who are enrolled in a United States post-secondary institution of higher education that indicated they were in years 1-5 of undergraduate study on the NCHA.

15. *Year in school* is operationally defined in the study as designated on the NCHA as first year undergraduate, second year undergraduate, third year undergraduate, fourth year undergraduate, and fifth year undergraduate.

Summary

Alcohol use is a public health problem for the world and in the United States. Empirical evidence shows that a substantial proportion of college students drink alcohol and engage in heavy drinking, commonly known as binge drinking. Research also shows that college students engage in other types of drinking, such as frequent drinking, defined in this study as using alcohol on six or more days in the previous 30 days and/or drinking the same amount as one indicated they had the last time they socialized on three or more occasions with the last two weeks. Types of harm among college students are associated with alcohol use such as self-injuries and harm to others.

The purpose of this research study was to create a profile of four types of undergraduate alcohol drinkers enrolled in post-secondary institutions in the Southern United States. The study focused on non-frequent, frequent, non-binge and binge drinkers. The study also identified alcohol-related personal protective behaviors and analyzed the difference in alcohol-related health consequences reported by non-frequent, frequent, non-binge and binge drinkers who were undergraduate college students enrolled in higher education institutions in the Southern United States. Findings from the

research study can be of use to college health professionals in their work to reduce the negative alcohol-related health consequences experienced by college students.

CHAPTER II

LITERATURE REVIEW

Introduction

The purpose of this chapter was to aid in understanding the parameters of the research study. Databases, research reports and research studies that examined alcohol use behaviors, personal protective behaviors and alcohol-related harm were reviewed. The literature reviewed was organized in the following manner: Studies that were related in content, studies related in methodology in relation to instrumentation and research topic, and studies related to both content and methodology.

Research and Literature Related in Content

The researcher conducted a review of literature. In the content section of the literature review, the researcher discussed alcohol use behaviors among United States young adults and college students; alcohol-related personal protective behaviors practiced by United States college students; and alcohol-related consequences experienced by college students.

Alcohol Use Behaviors Among United States Young Adults and College Students

Alcohol use includes consumption of alcoholic beverages including beer, wine, and liquor. High-risk alcohol use is determined by the amount and frequency of alcohol use. High-risk alcohol use is identified using various terms. Perhaps the most common term given to high-risk drinking is binge drinking. Binge drinking has commonly been defined as drinking five or more drinks in one sitting in the last two weeks for both males and females (Wechsler, Dowdall, Davenport, & Rimm, 1995; Presley & Pimentel, 2006).

Presley and Pimentel (2006) used the term "heavy drinking" to describe this style of drinking. The United States Department of Health and Human Services (DHHS) defined binge alcohol use on the National Survey on Drug Use and Health (NSDUH) as drinking five or more drinks on the same occasion on at least one day in the past 30 days (SAMHSA, 2007), while the Centers for Disease Control (CDC, 1997) identified this behavior as "current heavy episodic drinking" on the 1995 National College Health Risk Behavior Survey (NCHRBS). Other researchers have defined binge drinking using the gender-specific definition of four or more drinks for females and five or more drinks for males at least once during two weeks, based on the research conducted by Wechsler, Davenport, Dowdall, Moeykens, and Castillo (1994) in the College Alcohol Study (CAS) (Presley & Pimentel, 2006). Also of interest to researchers are types of drinking among college students such as frequent drinking and frequent binge drinking. The NCHRBS identified current frequent use of alcohol as drinking 20 or more of 30 days, finding that a small percentage of students and more males than females practiced this style of drinking (CDC). Wechsler, Lee, Kuo, Seibring, Nelson, and Lee (2002) reported a rise in frequent binge drinking among college students, as observed in the CAS between 1993 (20%) to 2001 (23%). They define frequent binge drinking as binge drinking three or more times in the past two weeks. Clearly, high-risk drinking behaviors are identified using various terms, depending on the source.

Several large-scale studies and research reports have examined the prevalence of alcohol use among young adults and college students in the United States. Examples include the National Survey on Drug Use and Health (NSDUH), Monitoring the Future (MTF), National College Health Risk Behavior Survey (NCHRBS), and the National

College Health Assessment (NCHA). The NSDUH and MTF examined the prevalence of substance abuse in the United States, including prevalence among young adults and college students. The NCHRBS and NCHA examined various health risk behaviors, including alcohol use of college students only.

National Survey on Drug Use and Health. The NSDUH, formerly known as National Household Survey on Drug Abuse, is an annual survey sponsored by the SAMHSA of DHHS (SAMHSA). The survey is administered using a state-based design, using in-person interviews of civilian participants ages 12 and older and in 2006, 67,802 interviews were obtained. The 2006 NSDUH has questions about consumption of alcoholic beverages, including beer, wine, whiskey, brandy and mixed drinks. The 2006 NSDUH showed that 50.9% of people aged 12 or older reported current use of alcohol (at least one drink in the past 30 days) and 23.0% engaged in binge drinking (drinking five or more drinks on the same occasion on at least one day in the past 30 days). Less than half (42.2%) of young adults age 18 to 25 reported binge drinking while 15.6% in this age group reported heavy alcohol use (drinking five or more drinks on the same occasion on each of five or more days in the past 30 days). Related to college enrollment, the 2006 NSDUH showed full-time college students were more likely to be alcohol users, as well as more likely to binge drink and drink heavily (SAMHSA). More full-time college students reported using alcohol in the past month (66.4%), binge drinking (45.5%) and heavy use of alcohol (19.0%) than 18-22 year olds not enrolled full-time (54.1%, 38.4%, and 13.3%, respectively) (SAMHSA).

The 2006 NSDUH showed gender and racial differences in alcohol use in the United States. Among persons aged 18 to 25, more males (65.9%) than females (57.9%) reported being current drinkers (SAMHSA). Binge alcohol use rates were highest among American Indians or Alaska Natives (31%) and lowest among Asians (11.8%) (among persons aged 12 or older) (SAMHSA). The binge alcohol use rate was 24.1% for White persons, 24.1% for Native Hawaiians or Other Pacific Islanders, 22.8% for people reporting two or more races, and 19.1% for Black persons (SAMHSA).

Overall, 2006 NSDUH results demonstrated that less than half of young adults aged 18-25 are binge drinkers. Related to gender and race, more males aged 18-25 report current alcohol use than females; and binge alcohol for people aged 12 and older rates are highest among American Indians or Alaska Natives and lowest for Asians. Concerning college students, more full-time college students were current users, binge users and heavy users of alcohol compared to same-aged non-college students.

Monitoring the Future. MTF is a research program conducted at the University of Michigan's Institution for Social Research that is funded by research grants from the National Institute on Drug Abuse (Johnston, O'Malley, Bachman, & Schulenberg, 2007). MTF administers annual surveys to nationally representative samples of students in grades 8, 10, and 12, and mails follow-up surveys to subsamples of previous participants, including college students, college-aged students not attending college, young adult high school graduates aged 19-30, and high school graduates at ages 35, 40 and 45 using cross-sectional, repeated cross-sectional and panel study designs. Representative samples of 2400 students are selected for follow-up surveys. For the purposes of MTF, college

students were defined as "…all full-time students, one to four years post-high school, enrolled in a two- or four-year college in March during the year of the survey" (Johnston et al., 2007, p. 2).

Johnston et al. (2007) reported in the 2006 MTF, that most (82.1%) college students reported using alcohol in the past year, with 66.2% reporting being drunk. More than half of (65.4 %) full-time college students one to four years beyond high school had used alcohol in the last 30 days and almost half (47.6%) had been drunk. More full-time college males (7.3 %) than females (3.2%) reported daily drinking and more males (45%) reported binge drinking in the last two weeks than females (37%). Major findings from the 2006 MTF showed that a majority of full-time college students have used alcohol in the past year and that more males than females report daily drinking and binge drinking (Johnston et al.).

National College Health Risk Behavior Survey. The 1995 NCHRBS was a national survey that measured a broad range of health risk behaviors among the college population in the United States (CDC, 1997). The one-time survey was administered to more than 7,000 students enrolled in 2-year and 4-year institutions. The response rate was 60% and resulted in a nationally representative sample of 4,838 full- and part-time students aged 18 years or older. Among the priority health risk behaviors measured were behaviors that contribute to adverse health outcomes, including tobacco use; alcohol and other drug use; sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including human immunodeficiency virus infection; unhealthy dietary behaviors; and physical inactivity (CDC).

Results from the 1995 NCHRBS related to college student alcohol use showed that a majority (68.2 %) of students reported consuming at least one alcoholic drink in the last 30 days, with significantly more males (72.9%) reporting the behavior than females (64.5%), and significantly more White students (72.4%) and Hispanic students (63.6%) reporting the behavior than Black students (54.2%). Current frequent use of alcohol (drinking 20 or more of 30 days preceding the survey) was reported by a small percentage of students (4.2%) overall and current heavy episodic drinking (consuming five or more drinks on at least one occasion in the last 30 days) was reported by 34.5% of students. Results also demonstrated that significantly more males reported current frequent alcohol use (6.6%), and current episodic heavy drinking (43.8%) than females (2.2% and 27.0%, respectively). In addition, 1995 NCHRBS results revealed that White students were significantly more likely to report current frequent use of alcohol (4.7%) than Black students (1.6%) and Hispanic students (2.0%), and also reported significantly more current episodic heavy drinking (39.5%) than Black students (12.5%) and Hispanic students (30.2%) (CDC, 1997).

Findings presented in the 1995 NCHRBS showed that current alcohol use, frequent alcohol use, and current episodic heavy use was more prevalent among college males compared to college females. In addition, White students were more likely to be frequent users and current episodic heavy users of alcohol than other races.

National College Health Assessment. The NCHA is a valid and reliable instrument developed by the American College Health Association (AHCA) that assesses college student behavior in the following areas: Health, health education, and safety; alcohol,

tobacco and drugs; weight, nutrition and exercise; mental and physical health; and impediments to academic performance. Participating institutions choose to administer the NCHA in either the Spring and/or Fall semester each year. Results from the Spring 2006 NCHA included data from institutions that used random sampling techniques were included in the analysis and formation of the reference group database, resulting in a final sample of 94,806 students.

Results related to alcohol use from the Spring 2006 NCHA showed that more females (55.9%) than males (51.1%) reported using alcohol 1-9 days in the last 30 days while more males (19.1%) than females (12.7%) reported using alcohol 10-29 days in the last 30 days (ACHA, 2006). More females (46.8%) than males (30.1%) reported having 1-4 drinks the last time they partied while more males (26.2%) than females (25.5%) report having 5-8 drinks (ACHA, 2007). Almost one-fourth (22%) of males reported drinking nine or more drinks the last time they partied compared to 6.3% of females (ACHA, 2007). Almost one-fourth (24.3%) of males reported consuming five or more drinks in a sitting (binge drinking) one to two times within the last two weeks, while a smaller portion of females (21.2%) reported binge drinking that often (ACHA, 2006). More males (15.9%) than females (8.6%) also reported binge drinking three to five times in the last two weeks (ACHA, 2006).

Findings from the 2006 NCHA indicated that college males generally had riskier drinking behaviors than college females. A higher proportion of males than females used alcohol on more days of the month and had more drinks the last time they partied. More males also reported binge drinking more often than females.

Alcohol-related Personal Protective Behaviors Practiced by United States College Students

Research provides empirical evidence that some college students use personal protective behaviors to reduce their risk of alcohol-related consequences. Both the CAS and NCHA instruments have personal protective behaviors listed. Examples of personal protective behaviors items on the CAS include:

> Stopping drinking at least 1-2 hours before going home, alternating with nonalcoholic beverages, having a designated driver, limiting the number of drinks, making one's own drinks, limiting money spent on alcohol, only drinking in safe environments, hanging out with trusted friends, counting drinks and pacing number of drinks per hour. (Benton, Schmidt, Newton, Shin, Benton, & Newton, 2004, p. 117)

Benton et al. used the CAS to study protective strategies and harmful drinking consequences in a derivation sample (N = 3,851) of undergraduates from four Midwestern universities in 2001 and a replication sample (N = 4,151) in 2002. Students indicated how frequently they practiced the personal protective behaviors, response options including never, rarely, sometimes, usually, and always. Their findings showed that if student drinkers who drank six or more drinks when they socialized used certain protective behaviors, especially among males, the likelihood of experiencing more common alcohol-related consequences decreased. Their findings also showed that female college students drank less than male students, were more likely to use protective behavioral strategies, and experienced less harmful alcohol-related consequences (Benton et al.).

The NCHA instrument also has survey items related to personal protective behaviors practiced by college students. Personal protective behaviors listed on the NCHA include:

1. Alternate non-alcoholic with alcoholic beverages
2. Determine, in advance, not to exceed a set number of drinks
3. Choose not to drink alcohol
4. Use a designated driver
5. Eat before an/or during drinking
6. Have a friend let you know when you've had enough
7. Keep track of how many drinks you were having
8. Pace your drinks to 1 or fewer per hour
9. Avoid drinking games
10. Drink an alcohol look-alike (non-alcoholic beer, punch etc.) (NCHA, 2003)

Students indicated how often they practiced each personal protective behavior by selecting from the following response options: Not applicable, always, usually, sometimes, rarely and never. The Spring 2006 NCHA demonstrated that females were more likely to use alcohol-related protective behaviors. For example, more females reported engaging in each behavior compared to males, respectively: Eating before or during drinking (80.6% and 76.6%); using a designated driver (80.2% and 67%); keeping track of how many drinks one has had (70.4% and 56.4%); avoiding drinking games (45.1% and 37.6%); determining, in advance, not to exceed a set number of drinks (40% and 29.4%); alternating nonalcoholic with alcoholic beverages (33.2% and 25%); pacing drinks to one or fewer per hour (34.8% and 19.6%); having a friend let you know when you have had enough (30.4% and 19.1%); choosing not to drink alcohol (27.5% and

20%); and drinking an alcohol look-alike (7.6% and 4.7%) (ACHA, 2007). Findings from the Spring 2006 NCHA demonstrated that a greater proportion of college females use personal protective behaviors than college males.

Delva, Smith, Howell, Harrison, Wilke, and Jackson (2004) used the NCHA to study personal protective behaviors and consequences in random sample of 1,355 public university students in Spring 2002. Findings from their study showed that the likelihood of experiencing alcohol-related consequences was less for those who had more frequent use of more types of alcohol-related personal protective behaviors. African American female students had more prevalent use of personal protective behaviors. Results also show that more females relied on personal protective behaviors and that "the magnitude of the association between protective behaviors and alcohol-related problems was stronger and significant only for female students" (Delva et al., 2004, p. 22). The findings presented important gender and racial differences in personal protective behaviors use and alcohol-related consequences.

Alcohol-related Consequences Experienced by United States College Students

Harmful consequences of alcohol use by college students run the gamut from minor personal damage to major damage to others. Wechsler, Lee, Kuo, Seibring, Nelson, & Lee (2002) used the following *select* alcohol-related problems listed on the CAS:

1. Miss a class
2. Get behind in school work
3. Do something you regret

4. Forget where you were or what you did

5. Argue with friends

6. Engage in unplanned sexual activities

7. Not use protection when you have sex

8. Damage property

9. Get into trouble with the campus or local police

10. Get hurt or injured

11. Require medical treatment for an overdose

12. Drove after drinking

13. Have ≥ 5 different alcohol-related problems.

On the CAS, respondents indicate how many times they experienced each problem over the last year (range = 0-9 or more times) (Benton, Schmidt, Newton, Shin, Benton, & Newton, 2004). Wechsler, Lee, Kuo, Seibring, Nelson and Lee (2002) compared results in four iterations (1993-2001) of the CAS to examine risky alcohol use, harmful alcohol-related consequences, and alcohol prevention efforts. For the original 1993 study, a random national sample of more than 17,000 students on 140 four-year college campuses selected from the American Council on Education's list of accredited universities was generated using probability and proportionate to enrollment size sampling (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). A cross-section of college students who were enrolled in 4-year colleges that had participated in previous survey years made up the 2001 sample. For comparisons in the study, only data from 119 colleges who

participated in the years 1993, 1997, 1999 and 2001 were included. Findings from their study demonstrated that during the course of eight years of survey administration, current alcohol users (used in the past 30 days) experienced alcohol-related problems at a steady or slightly increased rate, with significant increases on some indicators (Wechsler et al., 2002).

The NCHA instrument also has survey items related to alcohol-related harm experienced by college students. Alcohol-related problems listed on the NCHA include:

1. Physically injured yourself
2. Physically injured another person
3. Been involved in a fight
4. Did something you later regretted
5. Forgot where you were or what you did
6. Had someone use force or threat of force to have sex with you
7. Had unprotected sex (NCHA, 2003).

Students indicate whether they have experienced each consequence by selecting one of the following options: Not applicable/Don't drink, no and yes. On the Spring 2006 NCHA, More males reported experiencing most alcohol-related health consequence listed on the NCHA than females. For example, 37.8% of males reported that as a consequence of their drinking, they had done something they later regretted, while 34.2% of females reported this experience. More males (33.2%, 19%, 15.7%, 9.5%, 6.4%) reported forgetting where they were or what they did, physically injuring themselves, having

unprotected sex, being involved in a fight, and physically injuring another person than females (27.7%, 17.6%, and 12.5%, 3.9%, and 2.6%), respectively (ACHA, 2007). The only exception was that more females (1.6%) had had someone use force or threat of force to have sex with them compared to males (0.6%) (ACHA). Findings from the Spring 2006 NCHA demonstrated that a greater proportion of college males than females were more likely to experience most alcohol-related health consequences.

Haines, Barker and Rice (2006) used the Spring 2002 NCHA survey as the primary source of data to examine personal protective behaviors used as related to risk reduction in 28,258 college students. The researchers used a composite personal protective behaviors score and select alcohol-related problems for the analysis. Results showed that greater use of personal protective behaviors generally resulted in less alcohol-related consequences, including females reporting more personal protective behaviors practice than males and experiencing less alcohol-related problems. In addition, results indicated that some personal protective behaviors offered greater protection than others (Haines et al.). These findings suggested that use of some personal protective behaviors is effective in reducing one's risk of harm.

Literature Related to Methodology

The researcher conducted a literature review of studies related to the methodology. Studies that were related to instrumentation as well as studies that were related to research topic were reviewed.

Studies Related to Instrumentation

The NCHA instrument has been used since 2000 to examine various health risk behaviors among college students in the United States. In the following review of literature, researchers used the NCHA instrument to examine college student health behaviors other than alcohol use. A review of studies that were related to instrumentation in that they use either NCHA primary or secondary data to study topics other than alcohol use behaviors follows.

Leino and Kisch (2005) studied predictors of depression in college students using the Spring 2000 NCHA (N=20,164; 35 institutions). Only institutions that used a random sampling technique were included in this study and the reference group, resulting in a final sample size of 15,977 students at 28 institutions.

Leino and Kisch (2005) studied correlates and predictors of depression in college students. Items used from the NCHA included symptoms of depression, depression diagnoses, therapy and medication used to treat depression, student reports of depression within the last school year; and impediments to academics due to "depression/anxiety disorder/seasonal affective disorder" (Leino & Kisch, p. 68). Univariate statistics, non-parametric statistics and multiple variable logistical regression were statistical tests used in the study.

Results of statistical testing showed more females (12.8%) than males (6.2%) had a lifetime depression diagnosis, and of those, more than one-third (39%) had been diagnosed within the last school year. Significant, weak to moderate relationships were identified with regard to gender and depression symptoms, with a higher percentage of females than males reporting depression symptoms including the items "felt hopeless,"

"felt overwhelmed," "felt exhausted," "felt very sad," and "felt so depressed it was difficult to function" (Leino & Kisch, p. 68). Slightly less than one-fourth (23%) of the sample reported academic impacts from "depression/anxiety disorder/seasonal affective disorder" (Leino & Kisch, p. 68).

Findings suggested a relationship between gender and depression symptoms, with more females than males reporting most of the symptoms listed. In addition, being female; gay/lesbian/bisexual/transgender; and/or in an emotionally abusive relationship were predictors of both lifetime and last school year depression diagnoses (Leino & Kisch, 2005).

Adams and Rust (2006) conducted a retrospective secondary analysis to study perceived and actual sexual behaviors among a national sample of college students. NCHA cross-sectional data from 45,213 students who completed the Spring 2002 and Spring 2003 were used in the study. The final randomly selected sample (n=20,869) was delimited to 18-24 year-old non-married sexually active students.

Statistical analyses conducted by Adams and Rust (2006) included frequency statistics, one-way analysis of variance (ANOVA) using a Scheffe post-hoc test, and independent samples *t*-tests. Multinomial logistic regression and binary logistic regression were used to determine which demographic factors were associated with the largest difference in perceived versus actual sexual behavior. Dependent variables included perceived versus actual differences in the following: Number of sexual partners within the last 12 months, sexual practice in the past 30 days, and using condoms in the past 30 days.

Results of statistical testing showed for the dependent variables number of sexual partners, sexual practice, and using condoms, 77.2%, 98.3%, and 67% perceived the norm to be greater than the actual sexual behaviors, respectively. With regard to each of the dependent variables, many differences in normative gaps were observed according to demographic factors. "Normative gaps persisted after adjusting for actual behavior among Black, Hispanic, and Asian students; student living with parents; freshmen females; and both bisexual and gay students" (Adams & Rust, p. 27). The findings of the study suggested that college students largely overestimate sexual behaviors, and in accordance with social norms theory, may result in riskier sexual behaviors in some college student subgroups (Adams & Rust).

Studies Related to Research Topic

A variety of instruments have been used to study college student alcohol consumption. The following are research studies that used instruments other than the NCHA to study alcohol use behaviors.

One of the most comprehensive surveys used to the study of college student alcohol use is the CAS. Wechsler, Davenport, Dowdall, Moeykens, and Castillo (1994) used a random national sample, generated using probability and proportionate to enrollment size, of more than 17,000 full-time undergraduate students on 140 four-year college campuses selected from the American Council on Education's list of accredited universities for the 1993 CAS. A 20-page survey about alcohol use was mailed to 28,709 students and 17,592 students returned the survey, a response rate of about 69%.

Statistical tests completed included chi-square analysis, used to compare past year alcohol drinkers to non-binge drinkers (past year drinkers who had not binged),

infrequent binge drinkers (engaged in binge drinking one or two times in the previous two weeks), and binge drinkers (for males, drinking five or more drinks in a row, for females, drinking four or more drinks in a row, in the previous two weeks). In addition, logistic regression was used to examine the likelihood of frequent binge drinkers (binge drinking three or more times in the previous two weeks) of experiencing alcohol-related problems or driving behavior as compared to non-binge drinkers as well as to compare infrequent binge drinkers to non-binge drinkers (Wechsler et al., 1994). Odds ratios were adjusted for demographic characteristics. To examine the secondary effects of binge drinking, schools were divided into three groups based on binge status: High binge schools (51% or more of students binged); middle-level binge schools (36 to 50% of students binged); and low-level binge schools (35% or less binged). Chi-square was used to compare non-bingers in the past two weeks and dorm residents, fraternities, or sororities according to each of the three school groups (Wechsler et al.).

Result of the 1993 CAS showed that 16% of students were nondrinkers, 41% were drinkers, but not bingers; 44% were binge drinkers, and 19% of binge drinkers were frequent binge drinkers. Students at schools with high- and middle-level binging were more likely than students at low-level binging schools to experience most of the secondary binge effects listed. A strong, positive relationship was found between the frequency of binge drinking and alcohol-related health and other problems, including the finding that frequent bingers were 25 times more likely than non-binge drinkers to experience five or more of 12 possible problems listed on the survey. Findings indicated that binge drinking was prevalent among United States college students, and that frequent

binge drinking was greatly associated with experiencing problems for users and those in their environment (Wechsler et al.).

The Core Alcohol and Drug Survey is another comprehensive college alcohol use survey. Presley and Pimentel (2006) used a revision of the Core Alcohol and Drug Survey Long Form to study high-risk undergraduate college students who were clustered into a stratified random sample based on region and type of school. The final sample was 17,821 students from 96 institutions, weighted to ensure representation of United States college students. A pre-survey letter was mailed inviting students to complete their choice of paper or web-based survey. The survey included questions about alcohol and drug use, negative consequences, perceptions of substance use risks, and other health issues.

Presley and Pimentel (2006) conducted statistical analyses to determine the differences between groups including ANOVA and Pearson chi-square. Categories of high-risk drinkers were identified, including non-heavy drinkers (consuming less than five drinks on an occasion); heavy drinkers (consuming five or more drinks on a single occasion in the previous two weeks); and students who were both heavy and frequent drinkers (heavy drinkers who consumed alcohol three or more occasions during the week). Findings showed that most students in the sample were non-heavy drinkers. The riskier the drinking behavior reported, the more negative consequences reported. For example, non-heavy drinkers, heavy drinkers, and frequent and heavy drinkers experienced a mean of 3.9, 11.8, and 28 negative consequences, respectively. Almost half of the negative consequences were experienced by the frequent and heavy category

of drinker. The researchers noted that students with the latter style of drinking were at the greatest risk among drinkers (Presley & Pimentel).

Literature Related to Content and Methodology

Researchers have used the NCHA to study college student alcohol consumption. A literature review produced the following studies that used the NCHA in studying college student alcohol use behaviors.

Perkins, Haines and Rice (2005) used NCHA data to examine receipt of health information by students, student alcohol use and perceptions of alcohol use by their peers, alcohol-related negative health consequences and alcohol-related academic impediments. Data used for the study were taken from the NCHA database collected from the Spring 2000 through Spring 2003 semesters. Delimitations set by the researchers included random sampling methods employed by participating institutions, and a minimum sample size of 100 students. If institutions participated in more than one year, only the most recent year was included in the analysis. The final database consisted of 76,145 participants from 130 United States colleges and universities.

Perkins et al. (2005) employed multivariate analyses to examine relationships between variables in the study. The following relationships were examined: The actual median number of drinks consumed by students and their perception of the median number of drinks consumed by their peers; the influence of their perception of peer alcohol use on their own alcohol use according to demographic characteristics as well as perception of peer alcohol use in relation to the actual drinking norm of their school; and the relationship between health information and perceptions of school alcohol use.

Findings from the research study demonstrated that most schools fell in the middle range of three to four median drinks and that students greatly overestimated the norm at their school, regardless of the actual norm of drinking among their peers. Findings also demonstrated that the campus-drinking norm was a strong predictor of student alcohol use. In addition, findings suggested that risky alcohol use and negative alcohol-related consequences were lower among students attending colleges where receiving health information was linked to less distorted perceptions of peer alcohol use (Perkins et al.).

Martens, Taylor, Damann, Page, Mowry, and Cimini (2004) studied the protective behaviors and negative alcohol-related consequences of undergraduate college students at a large northeast United States public university using the NCHA. The final sample size was 556 students recruited from a random sample of undergraduate classes and a convenience sample of lecture classes.

Martens et al. (2004) employed hierarchical logistic regression to analyze the relationship between personal protective behaviors used by students and their experience of negative alcohol-related consequences. Gender and alcohol consumption were entered as the first two steps as covariates, followed by the third step of a personal protective behaviors score. The personal protective behaviors score was calculated using 1 (*never*) to 5 (*always*) for each of the eight relevant personal protective behaviors items, adding the scores from each individual personal protective behaviors, resulting in a final personal protective behaviors score range of 8-40 (Martens et al.).

Results of the study indicate a range of 4.1-48.2% of participants had experienced a variety of negative alcohol-related consequences and that a range of 36.9-92.3% of

students indicated that they sometimes, usually or always used a variety of personal protective behaviors. Findings of the study demonstrated that when controlling for gender and alcohol consumption, less use of personal protective behaviors was associated with more negative alcohol-related consequences, indicating that personal protective behaviors may have the potential to play a part in college student intervention programs (Martens et al.).

Summary of Literature Review

Research studies and reports that examined alcohol use behaviors, alcohol-related personal protective behaviors and alcohol-related consequences among young adults and college students were reviewed. A majority of college students reported current alcohol use. Multiple college alcohol studies have identified various drinking types, including students who binge drink, students who drink frequently, and students who are both frequent and binge drinkers. Research suggested that some students tend to use personal protective strategies in order to reduce their risk of alcohol-related harm. Research studies also suggested that the riskier the drinking behavior, the more likely that harmful alcohol-related consequences will occur.

CHAPTER III

METHODOLOGY

Introduction

The purpose of the research study was to create a profile of and identify the self-reported alcohol-related health consequences reported by non-frequent, frequent, non-binge and binge undergraduate alcohol drinkers enrolled in post-secondary institutions in the Southern United States. The differences between the alcohol-related personal protective behaviors reported by non-frequent, frequent, non-binge and binge drinkers who were enrolled as undergraduate college students in higher education institutions in the Southern United States were also analyzed.

The purpose of this chapter was to establish the methodology used in the study. The research questions were stated and a description of the study population, instrumentation, sampling techniques, study design, data collection and management and statistical analyses were discussed. A chapter summary was also included.

Research Questions

Research questions were formulated to meet the purpose of the study. The research questions addressed in the study were as follows:

1. What is the relationship between the frequency of self-reported alcohol drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?

2. What is the relationship between the self-reported binge alcohol drinking by college student in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?

3. Are there significant differences between the frequency of self-reported alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?

4. Are there significant differences between self-reported binge alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?

5. What is the relationship between the frequency of self-reported alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?

6. What is the relationship between self-reported binge alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?

Study Population

The National College Health Assessment (NCHA) aggregate database was used for the secondary analysis for the research study. The subjects of the original study were college students enrolled in two-year and four-year post-secondary institutions in the United States during the Spring 2006 semester that completed the NCHA. The study population included all Southern post-secondary institutions in Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia, and the District of Columbia who self-selected to participate in the NCHA and whose data was available in the database maintained by the American College Health Association (ACHA) for the Spring 2006 semester. For the purpose of the research study, only data from undergraduate college students enrolled in higher education institutions in the Southern United States in 2006 and included in the ACHA database were analyzed.

Instrumentation

The researcher conducted a literature review to find an instrument that measured college student alcohol use. The researcher found the NCHA, an instrument that addressed many college student health risk behaviors. The NCHA consists of questions in the following content areas: (a) health, health education and safety; (b) alcohol, tobacco, and drug use; (c) sex behavior, perceptions and contraception; (d) weight, nutrition and exercise; (e) mental and physical health; (f) impediments to academic performance; and (g) demographic characteristics. The ACHA has collected self-reported survey data using the NCHA since 2000. The data was made available by request to the researcher from ACHA.

The NCHA survey was developed by an ACHA interdisciplinary workgroup in 1998 (ACHA, 2004). The ACHA reported that they made the NCHA using the following established surveys: National College Health Risk Behavior, Student Health Survey, Core Alcohol and Drug Survey, College Alcohol Study, Annual Student Health Behavior Assessment, Monitoring the Future study, and the National Health Objectives outlined in Healthy People 2000 (ACHA, 2001).

The NCHA was determined to be reliable and valid for generalization to college students in the United States (ACHA, 2001). After pilot testing and further refinement, the survey was first implemented in 2000 (ACHA, 2001). The data collected from the pilot tests and the Spring 2000 NCHA were merged with data from the 1995 National College Health Risk Behavior Survey to evaluate reliability and validity (ACHA, 2004). Reliability and construct validity of the NCHA was established using the three NCHA pilots, the Spring 2000 NCHA, and the 1995 National College Health Risk Behavior

Survey (ACHA, 2004). Measurement validity of the NCHA was established using the College Alcohol Study (Leino & Kisch, 2005). Statistical testing for reliability showed consistency in standardized alphas between common items on the Spring 2000 NCHA and the 1995 National College Health Risk Behavior Survey (Leino & Kisch). Construct validity analysis showed consistency in correlation between the NCHA and 1995 National College Health Risk Behavior Survey and measurement validity analyses showed similar odds ratios among variables from the NCHA and the College Alcohol Study (Leino & Kisch).

The ACHA compiles data from NCHA survey results into an electronic database and prepares a reference group report and executive summary twice a year. Stipulations imposed by the ACHA for institutional data to be included in reference group reports and the database include: Institutional Review Board approval at the individual institution and signed informed consent forms (ACHA, 2004). The national database consists of self-reports of college students whose schools randomly select their respondents or provided the survey to class sections that were randomly selected (ACHA, n.d.; M. Hoban, personal communication, January 3, 2008).

Sampling Techniques

The population for the research study included college students who self-reported information on the NCHA who attended post-secondary institutions in the Southern United States that chose to participate in the Spring 2006 NCHA. Student data was subsequently entered and available in the NCHA database maintained by the ACHA. Post-secondary institutions have the option of administering the Fall or Spring version of the survey. The only difference in the Spring and Fall versions is that every place that the

Spring version asks about "the last school year," the Fall version asks about "the last 12 months." "Last 30 day" items are the same on both versions of the survey. The 2006 Spring semester was selected by the researcher for use in this study because it was the most recent data available and because more college students were reported to participate in that semester than any other semester since the survey's inception.

During the Spring semester of 2006, a total of 117 total higher education institutions participated in the United States. This included 26 higher education institutions from the South; 26 from the Northeast; 29 from the Mid-west; and 32 from the West. Responses for four additional institutions were also included in the database and classified in the "Other" category. Self-reported college student responses from participating higher education institutions located in the southern United States were included in this study. This included the states of Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia as well as the District of Columbia. Self-reported responses of 19,590 college students enrolled in a total of 26 post-secondary institutions were selected for analysis in this study.

Study Design

The researcher conducted a secondary analysis of data from the Spring 2006 NCHA in order to create a profile of non-frequent and frequent alcohol drinkers and non-binge and binge alcohol drinkers, and to examine the alcohol-related personal protective behaviors and alcohol-related health consequences reported by undergraduate college students enrolled institutions of higher education in the Southern United States. The researcher contacted the ACHA regarding the use of their databases. The ACHA

required an "ACHA-NCHA Data Use Request Form" document to be completed, submitted and approved. The form consisted of eight sections and inquired information about the principal investigator, co-principal investigators and other individuals assisting in the research. Specific research project information including the purpose and hypotheses of the study; and specific research data being requested, including survey time period, specific survey questions being requested, and analyses plans; intended dissemination of results; data use guidelines; and data use agreement conditions was also required. The ACHA emailed the form to the researcher. The researcher completed the form and requested alcohol-related survey items and demographic items that met the purpose of the study. The completed form was submitted to the ACHA and approved (see Appendix A).

Data Collection and Management

The researcher used secondary data collected by the ACHA in Spring 2006. The researcher submitted a data use request form to ACHA. Once approval from the ACHA was granted (see Appendix B for approval letter), disks containing the data were mailed to the researcher. The researcher also requested permission from ACHA to include the copyrighted NCHA instrument in the appendix of her dissertation (see Appendix C). Permission was granted by the ACHA. See Appendix D for a copy of the NCHA instrument.

The purpose and research questions of the study required the researcher to use responses from demographic (questions 46, 49, and 51), alcohol use (questions 9d, 12, 13, 14, 16), alcohol-related personal protective behaviors (question 17), and alcohol-related health consequences (question 18) items on the NCHA survey. The researcher

organized alcohol use into groups of questions related to frequency of alcohol consumption (questions 9d, 12 and 14) and questions related to binge alcohol consumption (questions 13 and 16). The researcher used responses from the questions related to frequency of alcohol use to categorize students into two groups: Frequent drinkers and non-frequent drinkers (see Table 1). Question 12 was excluded in identifying frequent drinking behavior because the literature review did not produce a target number of hours as a separate indicator, without the number of drinks being included. For the purpose of this study, students were categorized and coded as non-frequent drinkers if they reported using alcohol less than six days in the last 30 days (question 9); *and* indicated that they had drank the same or more alcohol as indicated in question 13 on less than three occasions (question 14). Students were categorized and coded as frequent drinkers for the purpose of this study if they indicated that they had used alcohol six or more days in the last 30 days (question 9); *and/or* indicated that they had drank the same or more alcohol as indicated in question 13 on three or more occasions (question 14). The researcher also used responses from the questions related to binge alcohol use (questions 13 and 16) to categorize and code students into two groups: Non-binge drinkers and binge drinkers (see Table 2). Students were categorized by the researcher as non-binge drinkers if they self-reported having less than five alcoholic drinks the last time they socialized (question 13); *and* indicated that they had not had five or more alcoholic drinks at a sitting in the last two weeks (question 16). Students were categorized as binge drinkers if they reported that they had five or more alcoholic drinks the last time they socialized (question 13); *and/or* indicated that they had had five or more alcoholic drinks at a sitting one or more times in the last two weeks (question 16).

Table 1. Criteria for Categorizing Respondents as Non-Frequent or Frequent Drinkers

NCHA Questions	NCHA Responses	Non-Frequent Drinker[a]	Frequent Drinker[b,c]	Type of Data As Categorized
9.d. Within the last 30 days, on how many days did you use: Alcohol (beer, wine, liquor)?	Never used; Have used, but not in the last 30 days; 1-2 days; 3-5 days; 6-9 days; 10-19 days; 20-29 days; all 30 days	0-5 days	6 or more days	Nominal
14. In the last two weeks, on how many occasions did you drink the same or more alcohol as indicated in item #13? State your best estimate.	0-99 occasions	0-2	3 or more	Nominal

Note. [a]Students who selected 0-5 drinks for question 9d *and* 0-2 occasions for question 14 were categorized as non-frequent drinkers. [b]Wechsler, Lee, Kuo, and Lee (2000) identified frequent binge drinking as binging three or more times in two weeks. Therefore, the researcher defined frequent drinking as drinking six or more days in 30 days and defined frequent drinking as drinking three or more occasions in two weeks. [c]Students who selected 6 or more drinks for question 9d *and*/*or* 3 or more occasions for question 14 were categorized as frequent drinkers.

Table 2. Criteria for Categorizing Respondents as Non-binge or Binge Drinkers

NCHA Questions	NCHA Responses	Non-Binge Drinker[a]	Binge Drinker[b,c]	Type of Data As Categorized
13. The last time you partied/socialized, how many alcoholic drinks did you have? State your best estimated.	0-99 drinks	0-4	5 or more	Nominal
16. Think back over the last two weeks. How many times, if any, have you had five or more alcoholic drinks at a sitting?	None; 1 time; 2 times; 3 times; 4 times; 5 times; 6 times; 7 times; 8 times; 9 or more times	0	1 or more	Nominal

Note. [a]Students who selected 0-4 drinks for question 13 *and* selected zero times for question 16 were categorized as non-binge drinkers. [b]The Substance Abuse and Mental Health Services Administration (2007) identified binge alcohol use as five or more drinks on the same occasions at least one day in the past 30 days on the National Survey on Drug Use and Health surveys. Therefore, the researcher defined binge drinking as drinking five or more drinks the last time one socialized; and defined binge drinking as drinking five drinks in a row at least one time in two weeks. [c]Students who selected five or more drinks for question 13 *and/or* one or more times for question 16 were categorized as binge drinkers.

The researcher stratified the national data by region to obtain responses from the South and delimited the sample to include only undergraduate students. Students and colleges were only identified as numbers in the database so that specific names of students or colleges were not provided or identified.

Statistical Analysis

The statistical analysis of this data was performed using Statistical Package for Social Sciences version 15.0 Statistical Program. Frequencies were calculated for relevant demographic and alcohol-related questions to create a profile. Further analyses

including chi-square tests and MANOVA tests were conducted to address the research questions of the study.

The researcher completed descriptive analyses of the demographic characteristics including gender, race and year in school (see Table 3). Gender categories were male and female (question 46). To simplify statistical analysis and upon the recommendation of the consulting statistician, race categories analyzed were narrowed to White and non-White (question 51). Year in school choices ranged from years 1-5 or more of undergraduate study (see question 49). In addition, descriptive analyses were completed for each category of drinker: Non-frequent, frequent, non-binge and binge drinkers. See Table 4 for a descriptive analysis of alcohol-related behaviors (question 17) and Table 5 for the descriptive analysis of alcohol-related health consequences (question 18). The results of the descriptive analysis are found in Chapter IV.

Statistical analysis also included analyses of the research questions. The research questions were analyzed using the statistical tests as shown in Tables 6-8. Results generated from completing statistical tests for research questions 1 and 2 were used to establish a profile of each type of alcohol drinker: Non-frequent, frequent, non-binge and binge drinkers (see Table 6). Results produced for research questions 3-6 allowed the researcher to examine the alcohol-related personal protective behaviors and health consequences of each type of drinker (see Tables 7-8). Results of the analyses of research questions are discussed in Chapter IV.

Chi-square tests were used to analyze data to address research questions 1 and 2 (see Table 6). Chi-square is a nonparametric test used to compare the frequency count between what is expected and what is observed (Neutens & Rubinson, 2002). The

Table 3. NCHA Demographic Variables of Gender, Race, and Year in School Selected For Analysis

NCHA Questions	Variable	NCHA Response Options	Categorization Used By Researcher	Type of Data	Statistical Test
46. What is your sex?	Gender	Female; Male	Female; Male	Nominal	Descriptive
51. How do you usually describe yourself?	Race	White – not Hispanic (includes Middle Eastern); Black – not Hispanic; Hispanic or Latino; Asian or Pacific Islander; American Indian or Alaskan Native; Other	Non-White; White	Nominal	Descriptive
49. Year in school:	Year in School	1st year undergraduate; 2nd year undergraduate; 3rd year undergraduate; 4th year undergraduate; 5th year or more undergraduate; Graduate or professional; Adult special; Other	1st year undergraduate; 2nd year undergraduate; 3rd year undergraduate; 4th year undergraduate; 5th year or more undergraduate	Ordinal	Descriptive

Table 4. Organization of Alcohol-Related Personal Protective Behaviors Descriptive Analysis

NCHA Question	NCHA Responses	Type of Data	Statistical Test
17. During the last school year, if you partied/socialized, how often did you:			
a. Alternate non-alcoholic with alcoholic beverages? **(Alternate Beverages)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
b. Determine, in advance, not to exceed a set number of drinks? **(Set Number of Drinks)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
c. Choose not to drink alcohol? **(Abstain)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
d. Use a designated driver? **(Use DD)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
e. Eat before and/or during drinking? **(Eat)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
f. Have a friend let you know when you've had enough? **(Friend Limit)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
g. Keep track of how many drinks you were having? **(Track Number)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
h. Pace your drinks to 1 or fewer per hour? **(Pace)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
i. Avoid drinking games? **(Avoid Games)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive
j. Drink an alcohol look-alike (non-alcoholic beer, punch etc.)? **(Drink Alcohol Look-Alike)**	Not applicable; Don't drink; Always; Usually; Sometimes; Rarely; Never	Ordinal	Descriptive

Table 5. Organization of Alcohol-Related Health Consequences Descriptive Analysis

NCHA Question	NCHA Responses	Type of Data	Statistical Test
18. If you drink alcohol, within the last school year, have you experienced any of the following as a consequence of your drinking?			
a. Physically injured yourself? **(Injure Self)**	Not applicable/Don't drink; No; Yes	Nominal	Descriptive
b. Physically injured another person? **(Injure Another)**	Not applicable/Don't drink; No; Yes	Nominal	Descriptive
c. Been involved in a fight? **(Fight)**	Not applicable/Don't drink; No; Yes	Nominal	Descriptive
d. Did something you later regretted? **(Regret)**	Not applicable/Don't drink; No; Yes	Nominal	Descriptive
e. Forgot where you were or what you did? **(Forget)**	Not applicable/Don't drink; No; Yes	Nominal	Descriptive
f. Had someone use force or threat of force to have sex with you? **(Force Sex)**	Not applicable/Don't drink; No; Yes	Nominal	Descriptive
g. Had unprotected Sex **(Unprotected Sex)**	Not applicable/Don't drink; No; Yes	Nominal	Descriptive

Table 6. Statistical Tests Used to Create Profile of Drinkers

Research Question	Dependent Variables	Type of Data	Independent Variables	Type of Data	Statistical Test
1. What is the relationship between the frequency of self-reported alcohol drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in college?	Non-Frequent[a] or Frequent[b] Drinker	Nominal	Gender **(Female/Male)**	Nominal	Chi-square
			Race **(Non-White/White)**	Nominal	Chi-square
			Year in School **(1-5 undergraduate)**	Ordinal	Chi-square
2. What is the relationship between the self-reported binge alcohol drinking by college student in the Southern United States and the college student demographic characteristics such as gender, race, and year in college?	Non-Binge[c] or Binge[d] Drinker	Nominal	Gender **(Female/Male)**	Nominal	Chi-square
			Race **White/White)**	Nominal	Chi-square
			Year in School **(1-5 undergraduate)**	Ordinal	Chi-square

Note. [a]Students were categorized as non-frequent drinkers if they reported using alcohol less than six days in the last 30 days (question 9); *and* indicated that they had drank the same or more alcohol as they had the last time they socialized, within the last two weeks, on less than three occasions (question 14). [b]Students were categorized as frequent drinkers if they indicated that they had used alcohol six or more days in the last 30 days (question 9); *and/or* indicated that they had drank the same or more alcohol as they had the last time they socialized, within the last two weeks, on three or more occasions (question 14). [c]Students were categorized as non-binge drinkers if they self-reported having less than five alcoholic drinks the last time they socialized (question 13); *and* indicated that they had not had five or more alcoholic drinks at a sitting in the last two weeks (question 16). [d]Students were categorized as binge drinkers if they reported that they had five or more alcoholic drinks the last time they socialized (question 13); *and*/*or* indicated that they had had five or more alcoholic drinks at a sitting one or more times in the last two weeks (question 16).

Table 7. Statistical Tests Used to Examine Alcohol-Related Personal Protective Behaviors

Research Question	Independent Variables	Type of Data	Dependent Variables	Type of Data	Statistical Test
3. Are there significant differences between the frequency of self-reported alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?	Non-Frequent[a] or Frequent[b] Drinker	Nominal	**Alternate Beverages**	Ordinal[e]	MANOVA
			Set Number of Drinks	Ordinal[e]	MANOVA
			Abstain	Ordinal[e]	MANOVA
			Use DD	Ordinal[e]	MANOVA
			Eat	Ordinal[e]	MANOVA
			Friend Limit	Ordinal[e]	MANOVA
			Track Number	Ordinal[e]	MANOVA
			Pace	Ordinal[e]	MANOVA
			Avoid Games	Ordinal[e]	MANOVA
			Drink Alcohol Look-Alike	Ordinal[e]	MANOVA
4. Are there significant differences between self-reported binge alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?	Non-Binge[c] or Binge[d]	Nominal	**Alternate Beverages**	Ordinal[e]	MANOVA
			Set Number of Drinks	Ordinal[e]	MANOVA
			Abstain	Ordinal[e]	MANOVA
			Use DD	Ordinal[e]	MANOVA
			Eat	Ordinal[e]	MANOVA
			Friend Limit	Ordinal[e]	MANOVA
			Track Number	Ordinal[e]	MANOVA
			Pace	Ordinal[e]	MANOVA
			Avoid Games	Ordinal[e]	MANOVA
			Drink Alcohol Look-Alike	Ordinal[e]	MANOVA

Note. [a]Students were categorized as non-frequent drinkers if they reported using alcohol less than six days in the last 30 days (question 9); *and* indicated that they had drank the same or more alcohol as they had the last time they socialized, within the last two weeks, on less than three occasions (question 14). [b]Students were categorized as frequent drinkers if they indicated that they had used alcohol six or more days in the last 30 days (question 9); *and/or* indicated that they had drank the same or more alcohol as they had the last time they socialized, within the last two weeks, on three or more occasions (question 14). [c]Students were categorized as non-binge drinkers if they self-reported having less than five alcoholic drinks the last time they socialized (question 13); *and* indicated that they had not had five or more alcoholic drinks at a sitting in the last two weeks (question 16). [d]Students were categorized as binge drinkers if they reported that they had five or more alcoholic drinks the last time they socialized (question 13); *and/or* indicated that they had had five or more alcoholic drinks at a sitting one or more times in the last two weeks (question 16). [e]Raw data was ordinal scale but put in a Likert scale. Likert is theoretically ordinal but is treated as interval by many people (Russ-Eft & Preskill, 2001).

Table 8. Statistical Tests Used to Examine Alcohol-Related Health Consequences

Research Question	Independent Variables	Type of Data	Dependent Variables	Type of Data	Statistical Test
5. What is the relationship between the frequency of self-reported alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?	Non-Frequent[a] or Frequent[b] Drinker	Nominal	**Injure Self**	Nominal	Pearson Chi-square
			Injure Another	Nominal	Pearson Chi-square
			Fight	Nominal	Pearson Chi-square
			Regret	Nominal	Pearson Chi-square
			Forget	Nominal	Pearson Chi-square
			Force Sex	Nominal	Pearson Chi-square
			Unprotected Sex	Nominal	Pearson Chi-square
6. What is the relationship between self-reported binge alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?	Non-Binge[c] or Binge[d] Drinker	Nominal	**Injure Self**	Nominal	Pearson Chi-square
			Injure Another	Nominal	Pearson Chi-square
			Fight	Nominal	Pearson Chi-square
			Regret	Nominal	Pearson Chi-square
			Forget	Nominal	Pearson Chi-square
			Force Sex	Nominal	Pearson Chi-square
			Unprotected Sex	Nominal	Pearson Chi-square

Note. [a]Students were categorized as non-frequent drinkers if they reported using alcohol less than six days in the last 30 days (question 9); *and* indicated that they had drank the same or more alcohol as they had the last time they socialized, within the last two weeks, on less than three occasions (question 14). [b]Students were categorized as frequent drinkers if they indicated that they had used alcohol six or more days in the last 30 days (question 9); *and*/*or* indicated that they had drank the same or more alcohol as they had the last time they socialized, within the last two weeks, on three or more occasions (question 14). [c]Students were categorized as non-binge drinkers if they self-reported having less than five alcoholic drinks the last time they socialized (question 13); *and* indicated that they had not had five or more alcoholic drinks at a sitting in the last two weeks (question 16). [d]Students were categorized as binge drinkers if they reported that they had five or more alcoholic drinks the last time they socialized (question 13); *and/or* indicated that they had had five or more alcoholic drinks at a sitting one or more times in the last two weeks (question 16).

nominal scale of the dependent variables and the comparison of frequencies between two groups made it appropriate to use the chi-square test for the research questions. If a relationship was found using the chi-square tests, adjusted residuals were reported. Adjusted residual are the difference between observed and expected cell counts (SPSS Base 7.0 Applications Guide, 1996). An adjusted residual of +2.0 and –2.0 was used for research questions 1 and 2 because these values identify cells that do not fit in the model of independence (SPSS Base 7.0 Applications Guide, 1996).

Multivariate analysis of variance (MANOVA) was used for research questions 3 and 4 (see Table 7). MANOVA was appropriate because there were several dependent variables of interval scale being examined. MANOVA is a parametric test used to determine whether significant differences exist among several groups with regard to two or more dependent variables (Neutens & Rubinson, 2002). Research questions 3 and 4 addressed question 17 on the NCHA, the use of personal protective behaviors. While answers to the question 17 were ordinal, data were treated as interval and placed on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always)*. Likert is theoretically ordinal but is treated as interval by many people (Russ-Eft & Preskill, 2001). For example, Martens, Taylor, Damann, Page, Mowry, and Cimini (2004) used a 5-point Likert scale for their analysis of the same question on the NCHA. For MANOVA tests, Wilks' Lambda was used to determine whether there was a significant difference. Analysis of variance (ANOVA) tests were used to further examine significant differences.

The non-parametric chi-square test was also used for research questions 5 and 6 (see Table 8). A chi-square analysis was appropriate because the scale of data for the dependent variables was nominal and frequencies were being compared between two

groups. Significant relationships were further examined using adjusted residuals, defined as the difference between observed and expected cell counts (SPSS Base 7.0 Applications Guide, 1996). An adjusted residual of +2.0 and –2.0 was used for research questions 5 and 6 because these values identify cells that do not fit in the model of independence (SPSS Base 7.0 Applications Guide, 1996).

Summary

The purpose of this chapter was to describe the methodology that was utilized in the study. The purpose and research questions were included. A description of the study population, instrumentation, sampling techniques, study design, and data collection and management were discussed. Statistical analysis procedures for the research study were also discussed. Results of the statistical analyses are found in Chapter IV.

CHAPTER IV

ANALYSIS OF THE DATA

Introduction

The purpose of Chapter IV was to report the results of statistical analyses conducted in the study. Study population demographic data and variables of the research study questions were analyzed and discussed. A p-value of .05 was used for all statistical tests. Sample sizes for individual analyses may vary from original sample size due to missing data.

Data Analysis

Data analysis in the research study included descriptive analyses of the study sample including the following: Demographic information, types of alcohol drinkers, alcohol-related personal protective behaviors, and alcohol-related consequences. Statistical analyses of the research questions were conducted as well. A discussion of the results of the analyses follows.

Analysis of the Demographic Information

The study population included all post-secondary institutions in the South who self-selected to participate in the National College Health Assessment (NCHA) and whose data was available in the NCHA database maintained by the American College Health Association (ACHA) for the Spring 2006 semester. Frequency distribution statistics were completed to examine demographic information. Data from 117 institutions and 94,806 students were included in the Spring 2006 NCHA database. Of these, 26 institutions (22%) were in the South, with a total of 19,590 Southern students

participating. Only undergraduate students were examined in the current study. The final sample was 14,540 students in years one to five or more of undergraduate study, enrolled in Southern institutions, which completed the NCHA in Spring 2006. Of the undergraduate Southern student sample, 9,230 (64.9%) were female and 4,986 (35.1%) were male (see Table 9). A majority of the sample indicated that they were White (10,384; 71.4 %), while almost a third were non-White (4,156; 28%) (see Table 10). Non-White included Black, Hispanic, Asian, Indian and other. The sample was comprised of 3,766 (25.9%) first year undergraduate students; 3,601 (24.8%) second year undergraduate students; 3,440 (23.7%) third year undergraduate students; 2,816 (19.4%) fourth year undergraduate students; and 917 (6.3%) fifth year or more undergraduate students (see Table 11). The results of the descriptive analysis showed that the sample of students enrolled in Southern United States institutions who participated in the 2006 NCHA were predominantly female, White, and in their first three years of college.

Analysis of the Types of Alcohol Drinkers

The researcher created four categories of alcohol drinkers. The categories were: Non-frequent, frequent, non-binge and binge drinkers. Students who selected 0-5 drinks for question 9d *and* 0-2 occasions for question 14 were categorized as non-frequent drinkers. Students who selected six or more drinks for question 9d *and*/*or* three or more occasions for question 14 were categorized as frequent drinkers. Frequency statistics were conducted to identify the proportion of students who reported frequent and non-frequent alcohol drinking.

Table 9. Gender Distribution of Undergraduate Student 2006 NCHA Respondents Enrolled in Southern United States Institutions

Gender	Frequency	Valid Percent
Female	9230	64.9
Male	4986	35.1
Total	14216	100

Table 10. Race Distribution of Undergraduate Student 2006 NCHA Respondents Enrolled in Southern United States Institutions

Race	Frequency	Valid Percent
Non-White	4156	28.6
White	10384	71.4
Total	14540	100

Table 11. Distribution of Year in School Reported By Undergraduate Student 2006 NCHA Respondents Enrolled in Southern United States Institutions

Undergraduate Year	Frequency	Valid Percent
1	3766	25.9
2	3601	24.8
3	3440	23.7
4	2816	19.4
5 or more	917	6.3
Total	14540	100

Frequency statistics indicated about two-thirds of students (9,647; 66.4%) were non-frequent drinkers and about one-third (4,876; 33.6%) were frequent drinkers (see Table 12 and Figure 1). Students who selected 0-4 drinks for question 13 *and* selected zero times for question 16 were categorized as non-binge drinkers. Students who selected five or more drinks for question 13 *and/or* one or more times for question 16 were categorized as binge drinkers. Frequency statistics were used to determine the proportion of students who were reported either binge or non-binge drinking. Results of the frequency analyses showed that more than half of students (8,172; 56.4%) were non-binge drinkers, and 6,330 (43.6%) reported binge alcohol use (see Table 13 and Figure 2).

Analysis of Alcohol-Related Personal Protective Behaviors

Table 12. Distributions of Non-Frequent and Frequent Drinkers Among Undergraduate Student 2006 NCHA Respondents Enrolled in Southern United States Institutions

Category of Drinker	Frequency	Valid Percent
Non-Frequent	9647	66.4
Frequent	4876	33.6
Total	14523	100

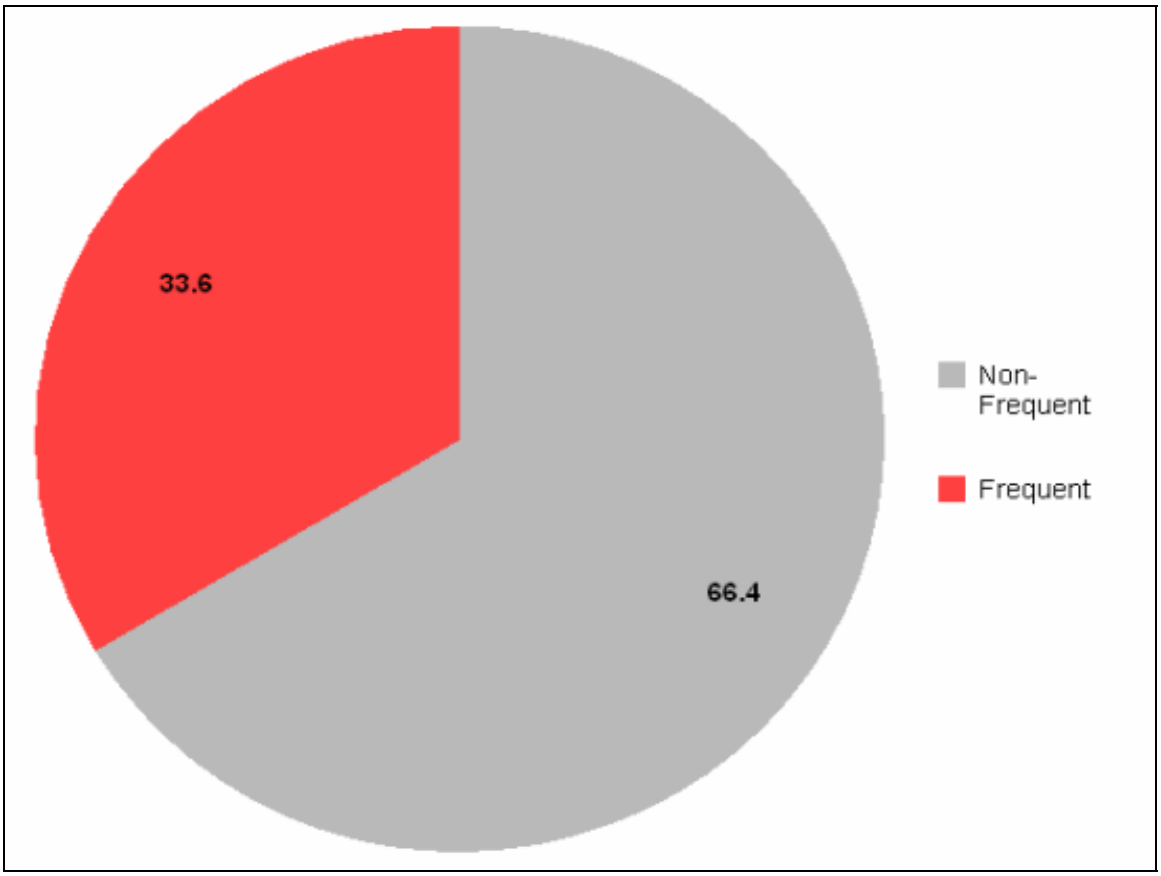

Figure 1. Percentage of Non-Frequent and Frequent Drinkers Among Undergraduate Student 2006 NCHA Respondents Enrolled in Southern United States Institutions.

Table 13. Distributions of Non-Binge and Binge Drinkers Among Undergraduate Student 2006 NCHA Respondents Enrolled in Southern United States Institutions

Category of Drinker	Frequency	Valid Percent
Non-Binge	8172	56.4
Binge	6330	43.6
Total	14523	100

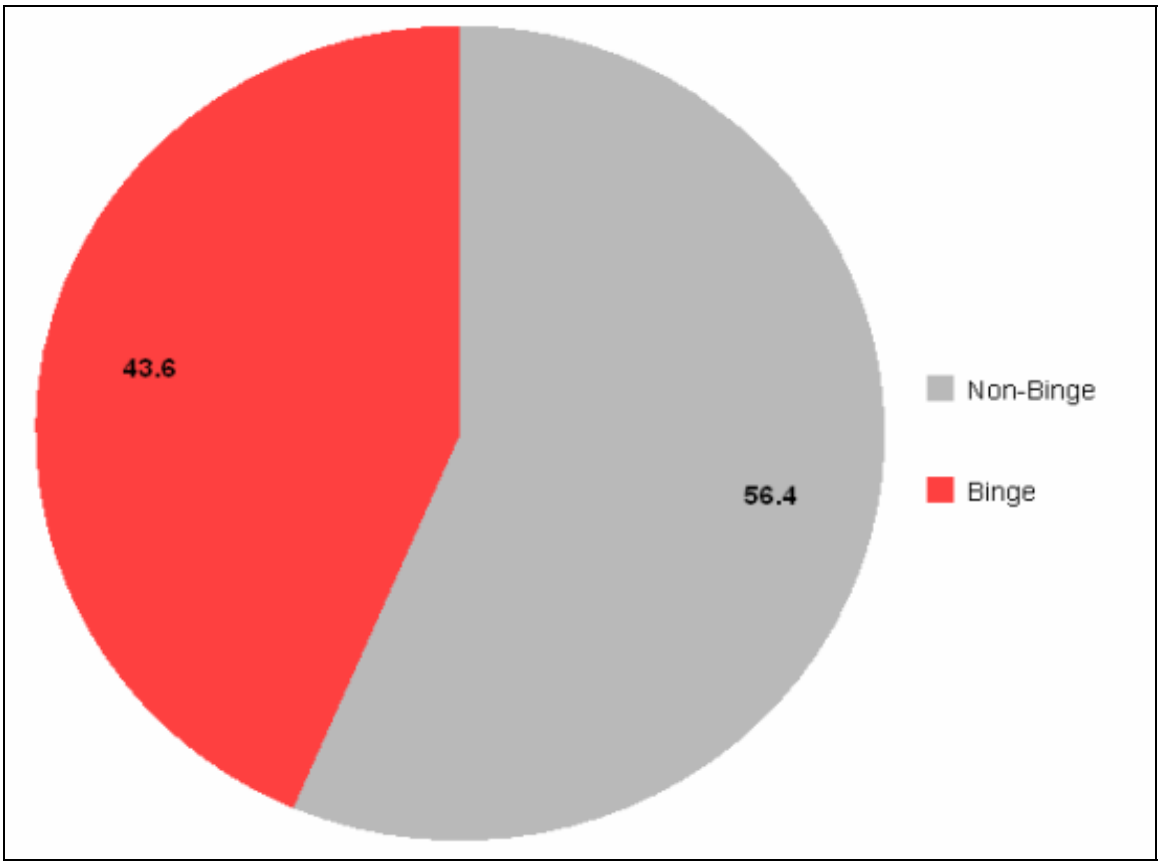

Figure 2. Percentage of Non-Binge and Binge Drinkers Among Undergraduate Student 2006 NCHA Respondents Enrolled in Southern United States Institutions.

The descriptive analysis of the alcohol-related personal protective behaviors reported by 2006 NCHA undergraduate student respondents in the Southern United States is shown in Table 14. Student responses of "not applicable" and "never" were combined. Almost one-fourth (2,558; 23.3%) of student respondents reported that they always alternate non-alcoholic with alcoholic beverages. About one-fourth (2,882; 26.6%) of respondents reported usually alternating beverages. Almost 20% (2,161) reported that they sometimes and 1,055 (9.6%) report that they rarely alternate non-alcoholic with alcoholic beverages. There were 2,305 (21.0%) students who responded "not applicable" or "never" to alternating non-alcoholic with alcoholic beverages.

In response to "determined not to exceed a set number of drinks," 1,899 (17.3%) of students reported that they always use the protective behavior while 2,213 (20.2%) reported that they usually practiced that protective behavior. Similar proportions of respondents (2,038; 18.6%) and (2,073; 18.9%) reported that they sometimes or rarely determined in advance not to exceed a certain number of drinks, respectively. There were 2,740 (25.0%) students who responded "not applicable" or "never."

With regard to using abstinence as a protective behavior, less than one-fifth (2,154; 18.3%) of students reported that they always abstain from alcohol, 5,275 (44.9%) reported usually abstaining, 2,302 (19.6%) reported abstaining sometimes and 971 (8.3%) reported abstaining rarely. There were 1,037 (8.8%) that responded "not applicable" or "never" to abstaining from alcohol. A majority of students (5,960; 55.3%) reported that they rarely used a designated driver, while 480 (4.5%) reported that they always used one. There were 825 (7.7%) of students who responded "not applicable" or "never" to using a designated driver. Less than one-fourth (2,305; 21.4%) of respondents reported

Table 14. Descriptive Analysis of Alcohol-Related Personal Protective Behaviors Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

NCHA Question	Frequency (Valid Percent)					
17. During the last school year, if you partied/socialized, how often did you:	Always	Usually	Sometimes	Rarely	N/A or Never	Total
a. Alternate non-alcoholic with alcoholic beverages? **(Alternate Beverages)**	2558 (23.3%)	2882 (26.3%)	2161 (19.7%)	1055 (9.6%)	2305 (21.0%)	10961 (100.0%)
b. Determine, in advance, not to exceed a set number of drinks? **(Set Number of Drinks)**	1899 (17.3%)	2213 (20.2%)	2038 (18.6%)	2073 (18.9%)	2740 (25.0%)	10963 (100.0%)
c. Choose not to drink alcohol? **(Abstain)**	2154 (18.3%)	5275 (44.9%)	2302 (19.6%)	971 (8.3%)	1037 (8.8%)	11739 (100.0%)
d. Use a designated driver? **(Use DD)**	480 (4.5%)	1213 (11.2%)	2305 (21.4%)	5,960 (55.3%)	825 (7.7%)	10783 (100.0%)
e. Eat before and/or during drinking? **(Eat)**	329 (3.0%)	1823 (16.6%)	4239 (38.5%)	4395 (40.0%)	212 (1.9%)	10998 (100.0%)
f. Have a friend let you know when you've had enough? **(Friend Limit)**	2241 (20.7%)	1876 (17.4%)	1663 (15.4%)	1,628 (15.1%)	3400 (31.5%)	10808 (100.0%)
g. Keep track of how many drinks you were having? **(Track Number)**	1217 (11.1%)	1646 (15.1%)	2696 (24.7%)	4439 (40.6%)	926 (8.5%)	10924 (100.0%)
h. Pace your drinks to 1 or fewer per hour? **(Pace)**	2705 (24.8%)	2384 (21.9%)	1682 (15.4%)	1400 (12.9%)	2717 (25.0%)	10888 (100.0%)
i. Avoid drinking games? **(Avoid Games)**	2189 (19.9%)	2059 (18.7%)	1782 (16.2%)	2636 (23.9%)	2361 (21.4%)	11027 (100.0%)
j. Drink an alcohol look-alike (non-alcoholic beer, punch etc.)? **(Drink Alcohol Look-Alike)**	1928 (17.4%)	1702 (15.3%)	561 (5.0%)	289 (2.6%)	6632 (59.7%)	11112 (100.0%)

using a designated driver sometimes and 1,213 (11.2%) reported that they usually use a designated driver.

There were 329 (3.0%) students who reported that they always eat before and/or during drinking, and 1,823 (16.6%) reported that they usually practice the behavior. In addition, 4,239 (38.5%) of students reported sometimes eating before and/or during drinking, about 40% (4,395) of respondents reported that they rarely eat before and/or during drinking, and 212 (1.9%) of respondents responded "not applicable" or "never".

Descriptive analysis also found that 2,241 (20.7%) reported always having a friend let them know when they have had enough to drink. There were 1,876 (17.4%) students who reported usually using the practice; 1,663 (15.4%) reported that they sometimes use the practice; 1,628 (15.1%) report that they rarely use the practice; and 3400 (31.5%) who responded "not applicable" or "never" to using the practice. With regard to tracking the number of drinks the last time they socialized, 1,217 (11%) reported that they always kept track of the number of drinks they were having. About 15% (1,646) reported that they usually kept track and about one-fourth (2,696; 24.7%) reported that they sometimes keep track. There were 4,439 (40.6%) students who indicated that they rarely keep track of the number of drinks that they are having. There were 926 (8.5%) students who reported "not applicable" or "never" to this item.

There were 2,705 (24.8%) respondents who reported they always pace drinks to one or fewer per hour, and slightly less (2,384; 21.9%) reported that they usually practice the protective behavior. The number of students who reported sometimes pacing their drinks was 1,682 (15.4%), 1,400 (12.9%) students reported that they rarely paced their

drinks, and 2,717 (25%) responded either “not applicable” or “never” to pacing their drinks.

In addition, 2,189 (19.9%) of respondents reported that they always avoid drinking games while they drank alcohol. Slightly less (2,059; 18.7%) reported that they usually avoid drinking games, 1,782 (16.2%) respondents reported that they sometimes avoid drinking games, and 2,636 (23.9%) reported that they rarely avoiding drinking games. There were 2,361 (21.4%) who responded “not applicable” or “never” with regard to avoiding drinking games.

Results of the descriptive analysis also showed the number of students who reported drinking an alcohol look-alike was as follows: 1,928 (17.4%) reported always using the personal protective behavior; 1,702 (15.3%) reported usually using the behavior, 561 (5.0%) reported sometimes, 289 (2.6%) reported rarely using the behavior. There were 6,632 responded “not applicable” or “never” drinking an alcohol look-alike.

Analysis of Alcohol-Related Health Consequences

The descriptive analysis of alcohol-related health consequences reported by undergraduate students enrolled in higher education institutions in the Southern United States is shown in Table 15. The following number of students reported “yes” to having alcohol-related consequences: 2,120 (19.3%) reported injuring themselves, 513 (4.7%) reported injuring another person, 729 (6.6%) reported being involved in a fight, 4,049 (36.8%) reported doing something they later regretted, 3,476 (31.6%) reported forgetting where they were or what they did, 171 (1.6%) reported having someone use force or threat of force to have sex with them, and 1,821 (16.6%) reported that they had unprotected sex. There were 8,886 (80.7%) students who reported they had not injured

Table 15. Descriptive Analysis of Alcohol-Related Health Consequences Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

NCHA Question	Frequency (Valid Percent)			
18. If you drink alcohol, within the last school year, have you experienced any of the following as a consequence of your drinking?	No	Yes	Total	N/A
a. Physically injured yourself? **(Injure Self)**	8,886 (80.7%)	2,120 (19.3%)	11,006 (100.0%)	3,414
b. Physically injured another person? **(Injure Another)**	10,492 (95.3%)	513 (4.7%)	11,005 (100.0%)	3,413
c. Been involved in a fight? **(Fight)**	10,276 (93.4%)	729 (6.6%)	11,005 (100.0%)	3,411
d. Did something you later regretted? **(Regret)**	6,941 (63.2%)	4,049 (36.8%)	10,990 (100.0%)	3,406
e. Forgot where you were or what you did? **(Forget)**	7,510 (68.4%)	3,476 (31.6%)	10,986 (100.0%)	3,398
f. Had someone use force or threat of force to have sex with you? **(Force Sex)**	10,822 (98.4%)	171 (1.6%)	3,405 (100.0%)	3,405
g. Had unprotected Sex **(Unprotected Sex)**	9,156 (83.4%)	1,821 (16.6%)	10,977 (100.0%)	3,386

themselves, 10,492 (95.3%) reported not injuring another person, 10,276 (93.4%) reported not being involved in a fight, 6,941 (63.2%) reported no to doing something they later regretted, 7,510 (68.4%) reported not forgetting where they were or what they did, 10,822 (98.4%) reported no to having someone use force or threat of force to have sex with them, and 9,156 (83.4%) reported that they had not had unprotected sex.

Analysis of the Research Questions

There were six primary research questions of the study. The research questions were analyzed as described below.

1. *What is the relationship between the frequency of self-reported alcohol drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?*

Chi-square tests were completed to determine if there was a significant relationship between the frequency of self-reported alcohol drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in college. See Table 16 for a summary of chi-square results. Cross tabulations were conducted to investigate significant relationships. A significance level of .05 was used. Adjusted residual values of +2.0 and –2.0 were considered significant for chi-square tests. See Figure 3 for a summary of adjusted residual results.

Chi-square analysis was used to determine whether there was a significant relationship between the frequency of self-reported alcohol drinking and gender. Results of the chi-square tests were significant at the .05 level, indicating a significant relationship existed between drinking frequency and gender ($\chi^2 = 110.725$, $df = 1$, $p = .000$) (see Table 16). Cross tabulation analyses showed 2,809 (30.5%) females and 1,951

Table 16. Summary of Chi-Square Results of Drinking Frequency By Demographic Characteristics Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Demographic Characteristic	*df*	*n*	χ^2	*p* value
Gender	1	14201	110.725	.000*
Race	1	14523	376.271	.000*
Year in School	4	14523	137.861	.000*

*Significant at the .05 level.

Demographic	**Non-Frequent**	**Frequent**
Gender		
Female	**More than expected**	Less than expected
Male	Less than expected	**More than expected**
Race		
Non-White	**More than expected**	Less than expected
White	Less than expected	**More than expected**
Undergraduate Year		
1	**More than expected**	Less than expected
2	**More than expected**	Less than expected
3	Less than expected	**More than expected**
4	Less than expected	**More than expected**
5+	Not significant	Not significant

Figure 3. Summary of Adjusted Residual Results for Drinking Frequency Self-Reported by Undergraduate College Students in the Southern United States.

(39.2%) males reported frequent drinking (see Table 17). Significant adjusted residuals for females (-10.5) showed females reported frequent drinking less than expected, while males (+10.5) reported frequent drinking more than expected. There were 6,414 (69.5%) females and 3,027 (60.8%) males who were self-reported non-frequent drinkers. More females were in the non-frequent category than expected. This was shown by a significant adjusted residual of +10.5. The adjusted residual for males was also significant (-10.5), indicating that males were under-represented as non-frequent drinkers.

Chi-square tests were also used to determine whether there was a significant relationship existed between frequency of self-reported alcohol drinking and race. The chi-square analysis results indicated a significant relationship between drinking frequency and race at the .05 level ($\chi^2 = 376.271$, $df = 1$, $p = .000$) (see Table 16). Cross

Table 17. Cross Tabulation Results of Drinking Frequency By Gender Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Gender	Count	Non-frequent drinker	Frequent drinker	Total
Female	Count	6414	2809	9223
	Expected Count	6131.6	3091.4	9223.0
	% within gender	69.5%	30.5%	100.0%
	Adjusted Residual	10.5*	-10.5*	
Male	Count	3027	1951	4978
	Expected Count	3309.4	1668.6	4978.0
	% within gender	60.8%	39.2%	100.0%
	Adjusted Residual	-10.5*	10.5*	
Total	Count	9441	4760	14201
	Expected Count	9441.0	4760.0	14201.0
	%	66.5%	33.5%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

tabulations showed that 3,892 (38.4%) White students and 894 (21.6%) non-White students reported being frequent drinkers (see Table 18). In addition, cross tabulations showed that 6,393 (61.6%) White students and 3,254 (78.4%) of non-White students reported being non-frequent drinkers. Significant adjusted residuals indicated that fewer non-White students (-19.4) were frequent drinkers than expected as and that more White students (+19.4) were frequent drinkers than expected. In addition, significant adjusted residuals showed that more non-White students (+19.4) were non-frequent drinkers than expected and fewer White students (–19.4) were non-frequent drinkers than statistically expected.

Chi-square analyses were conducted to examine the relationship between (see Table 16). Cross tabulations are shown in Table 19. Cross tabulation analysis

Table 18. Cross Tabulation Results of Drinking Frequency By Race Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Race	Count	Non-frequent drinker	Frequent drinker	Total
Non-white	Count	3254	894	4148
	Expected Count	2755.3	1392.7	4148.0
	% within race	78.4%	21.6%	100.0%
	Adjusted Residual	19.4*	-19.4*	
White	Count	6393	3982	10375
	Expected Count	6891.7	3483.3	10375.0
	% within race	61.6%	38.4%	100.0%
	Adjusted Residual	-19.4*	19.4*	
Total	Count	9647	4876	14523
	Expected Count	9647.0	4876	14523.0
	%	66.4%	33.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

demonstrated a significant relationship at the .05 level ($\chi^2 = 137.861$, $df = 4$, $p = .000$) showed that 1,026 (27.3%) of first year undergraduates and almost one-third (1,151; 32.0%) of second year undergraduates reported frequent drinking. There were 1,239 (36.1%) third year, 1,129 (40.1%) fourth year and 332 (36.2%) fifth year students who reported frequent drinking. There were 2,735 (72.7%) first year; 2,446 (68%) second year; 2,197 (63.9%) third year; 1,684 (59.9%) fourth year; and 585 (63.8%) fifth year undergraduate students who were non-frequent drinkers. Significant adjusted residuals for third year (+3.5) and fourth year (+8.2) undergraduates indicating that these students were over-represented as frequent drinkers compared to the expected count. Other significant adjusted residuals showed that fewer first year (-9.5) and second year (–2.3) undergraduates were frequent drinkers than statistically expected. More first year and second year undergraduate students reported non-frequent drinking than expected, with significant adjusted residuals of (+9.5) and (+2.3), respectively. Significant adjusted residuals were also found for third year (-3.5) and fourth year (-8.2) undergraduates, indicating the number of non-frequent drinking students observed was less than expected. Adjusted residuals for fifth year or more undergraduate students were not significant.

2. *What is the relationship between self-reported binge alcohol drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?*

Chi-square tests were employed to determine the relationship between the self-reported binge alcohol drinking by college students in the Southern United States and demographic characteristics such as gender, race, and year in college. A significance level of .05 was set. Results were significant for each demographic characteristic (see Table 20). Significant relationships were investigated by examining adjusted residuals.

Table 19. Cross Tabulation Results of Drinking Frequency By Year in School Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Undergrad Year in School	Counts	Non-Frequent Drinker	Frequent Drinker	Total
1	Count	2735	1025	3760
	Expected Count	2497.6	1262.4	3760.0
	% within Year in school	72.7%	27.3%	100.0%
	Adjusted Residual	9.5*	-9.5*	
2	Count	2446	1151	3597
	Expected Count	2389.3	1207.7	3597.0
	% within Year in school	68.0%	32.0%	100.0%
	Adjusted Residual	2.3*	-2.3*	
3	Count	2197	1239	3436
	Expected Count	2282.4	1153.6	3436.0
	% within Year in school	63.9%	36.1%	100.0%
	Adjusted Residual	-3.5*	3.5*	
4	Count	1684	1129	2813
	Expected Count	1868.6	944.4	2813.0
	% within Year in school	59.9%	40.1%	100.0%
	Adjusted Residual	-8.2*	8.2*	
5 or more	Count	585	332	917
	Expected Count	609.1	307.9	917.0
	% within Year in school	63.8%	36.2%	100.0%
	Adjusted Residual	-1.7	1.7	
Total	Count	9647	4876	14523
	Expected Count	9647.0	4876.0	14523.0
	%	66.4%	33.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

Table 20. Summary of Chi-Square Results of Binge Drinking Status By Demographic Characteristics Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Demographic Characteristic	*df*	*n*	χ^2	*p* value
Gender	1	14183	376.493	.000*
Race	1	14502	414.353	.000*
Year in School	4	14502	25.372	.000*

*Significant at the .05 level.

Values of +2.0 and –2.0 were considered significant for adjusted residuals. See Figure 4 for a summary of adjusted residual results.

A chi-square test was used to examine whether there was a significant relationship between the self-reported binge alcohol drinking by college students in the Southern United States and gender. Results showed a significant relationship at the .05 level (χ^2 = 376.493, *df* = 1, p = .000) (see Table 20). Cross tabulation showed that 2,710 (54.5%) males and 3,465 (37.6%) females were binge drinkers (see Table 21). There were 5,749 (62.4%) female self-reported non-binge drinkers and 2,259 (45.5%) male self-reported non-binge drinkers. Significant adjusted residuals for females (-19.4) showed that fewer females were binge drinkers than expected. In addition, significant adjusted residuals for males (+19.4) demonstrated that more males were binge drinkers than expected. With regard to non-binge drinking status, females were over-represented compared to the count expected, with a significant adjusted residual of +19.4. Male non-binge drinkers were under-represented when compared to the count expected, as shown by a significant adjusted residual of -19.4.

Demographic	Non-Binge	Binge
Gender		
Female	**More than expected**	Less than expected
Male	Less than expected	**More than expected**
Race		
Non-White	**More than expected**	Less than expected
White	Less than expected	**More than expected**
Undergraduate Year		
1	**More than expected**	Less than expected
2	Not significant	Not significant
3	Not significant	Not significant
4	Less than expected	**More than expected**
5+	Not significant	Not significant

Figure 4. Summary of Adjusted Residual Results for Binge Drinking Status Reported by Undergraduate College Students in the Southern United States.

Table 21. Cross Tabulation Results of Binge Drinking By Gender Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Gender	Count	Non-Binge drinker	Binge drinker	Total
Female	Count	5749	3465	9214
	Expected Count	5202.4	4011.6	9214.0
	% within gender	62.4%	37.6%	100.0%
	Adjusted Residual	19.4*	-19.4*	
Male	Count	2259	2710	4969
	Expected Count	2805.6	2163.4	4969.0
	% within gender	45.5%	54.5%	100.0%
	Adjusted Residual	-19.4*	19.4*	19.4
Total	Count	8008	6175	14183
	Expected Count	8008.0	6175.0	14183.0
	%	56.5%	43.5%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

A chi-square analysis was also completed to examine whether there was a significant relationship between self-reported binge alcohol drinking by college students in the Southern United States and race. The chi-square results indicated a significant relationship at the .05 level ($\chi^2 = 414.353$, $df = 1$, $p = .000$) (see Table 20). Cross tabulation results showed that 5,072 (48.9%) White students and 1,258 (30.4%) non-White students reported binge drinking (see Table 22). There were 5,290 (51.1%) White students and 2,882 (69.6%) non-White students who reported being non-binge drinkers. Significant adjusted residuals indicated that White students (+20.4) reported binge drinking more than expected and that non-White students (-20.4) reported binge drinking less than statistically expected. In addition, significant adjusted residuals indicated fewer White students (-20.4) and more non-White students (+20.4) were non-binge drinkers

Table 22. Cross Tabulation Results of Binge Drinking By Race Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Race	Count	Non-Binge drinker	Binge drinker	Total
Non-white	Count	2882	1258	4140
	Expected Count	2332.9	1807.1	4140.0
	% within race	69.6%	30.4%	100.0%
	Adjusted Residual	20.4*	-20.4*	
White	Count	5290	5072	10362
	Expected Count	5839.1	4522.9	10362.0
	% within race	51.1%	48.9%	100.0%
	Adjusted Residual	-20.4*	20.4*	
Total	Count	8172	6330	14502
	Expected Count	8172.0	6330.0	14502.0
	% within race	56.4%	43.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

than expected.

Chi-square tests were also conducted to examine the relationship between reports of binge alcohol drinking and year in school, producing significant results at the .05 level ($\chi^2 = 25.372$, $df = 1$, $p = .000$) (see Table 20). Cross tabulations showed 1,511 (40.3%) first year; 1,595 (44.4%) second year; 1,542 (44.9%) third year; 1,283 (45.7%) fourth year; and 399 (43.6%) fifth year undergraduates reported binge drinking (see Table 23). There were 2,242 (59.7%) first year; 1,998 (55.6%) second year; 1,890 (55.1%) third year; 1,525 (54.3%) fourth year; and 517 (56.4%) fifth year undergraduates that were non-binge drinkers. Cross tabulations produced significant adjusted residuals for first year undergraduates (+4.9) showing that more students in this year of college reported non- binge drinking than statistically expected. A significant adjusted residual of –4.9 showed that first year undergraduate students reported binge drinking less than expected. Fourth year undergraduates were under-represented in the non-binge category, as shown by a significant adjusted residual of -2.4. In addition, more fourth year undergraduates were binge drinkers than expected, with a significant adjusted residual of +2.4. Adjusted residuals for the second, third and fifth year students were not significant.

3. *Are there significant differences between the frequency of self-reported alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?*

A multivariate analysis (MANOVA) test was completed to determine if there were significant differences between alcohol-related personal protective behaviors used by frequent and non-frequent drinkers (see Table 24). Wilks' Lambda was used to determine whether there was a significant difference. Analysis of variance (ANOVA) tests were used to further examine significant differences (see Table 25).

Table 23. Cross Tabulation Results of Binge Drinking By Year in School Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Undergrad Year in School	Counts	Non-Binge Drinker	Binge Drinker	Total
1	Count	2242	1511	3753
	Expected Count	2114.8	1638.2	3753.0
	% within Year in school	59.7%	40.3%	100.0%
	Adjusted Residual	4.9*	-4.9*	
2	Count	1998	1595	3593
	Expected Count	2024.7	1568.3	3593.0
	% within Year in school	55.6%	44.4%	100.0%
	Adjusted Residual	-1.0	1.0	
3	Count	18907	1542	3432
	Expected Count	1934.0	1498.0	3432.0
	% within Year in school	55.1%	44.9%	100.0%
	Adjusted Residual	-1.7	1.7	
4	Count	1525	1283	2808
	Expected Count	1582.3	1225.7	2808.0
	% within Year in school	54.3%	45.7%	100.0%
	Adjusted Residual	-2.4*	2.4*	
5 or more	Count	517	399	916
	Expected Count	516.2	399.8	916.0
	% within Year in school	56.4%	43.6%	100.0%
	Adjusted Residual	.1	-.1	
Total	Count	8172	6330	14502
	Expected Count	8172.0	6330.0	14502.0
	% within Year in school	56.4%	43.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

Table 24. MANOVA Results of Drinking Frequency and Alcohol-Related Personal Protective Behaviors Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Dependent Variable	Mean Square	*F*	*p* value
17.a. Alternate Beverages	262.870	171.454	.000*
17.b. Set Number of Drinks	790.400	396.410	.000*
17.c. Abstain	1077.729	1475.930	.000*
17.d. Use DD	153.990	102.971	.000*
17.e. Eat	8.774	10.644	.001*
17.f. Friend Limit	98.559	47.952	.000*
17.g. Track Number	704.953	429.872	.000*
17.h. Pace	1317.310	799.297	.000*
17.i. Avoid Games	2230.080	1169.046	.000*
17.j. Drink Alcohol Look-Alike	569.838	583.226	.000*

*Significant at the .05 level. *df*=1.

Table 25. ANOVA Results of Drinking Frequency and Alcohol-Related Personal Protective Behaviors Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Dependent Variable	Drinking Frequency	Mean	Std. Deviation	N
17.a. Alternate Beverages	Non-frequent drinker	2.88	1.293	5608
	Frequent drinker	2.55	1.167	4521
	Total	2.73	1.249	10129
17.b. Set Number of Drinks	Non-frequent drinker	3.13	1.506	5608
	Frequent drinker	2.57	1.287	4521
	Total	2.88	1.439	10129
17.c. Abstain	Non-frequent drinker	3.14	.876	5608
	Frequent drinker	2.49	.827	4521
	Total	2.85	.915	10129
17.d. Use DD	Non-frequent drinker	4.22	1.247	5608
	Frequent drinker	3.98	1.192	4521
	Total	4.11	1.229	10129
17.e. Eat	Non-frequent drinker	4.15	.954	5608
	Frequent drinker	4.09	.847	4521
	Total	4.12	.908	10129
17.f. Friend Limit	Non-frequent drinker	2.71	1.537	5608
	Frequent drinker	2.51	1.294	4521
	Total	2.62	1.437	10129
17.g. Track Number	Non-frequent drinker	4.00	1.268	5608
	Frequent drinker	3.47	1.296	4521
	Total	3.76	1.307	10129
17.h. Pace	Non-frequent drinker	2.98	1.390	5608
	Frequent drinker	2.25	1.138	4521
	Total	2.65	1.333	10129
17.i. Avoid Games	Non-frequent drinker	3.38	1.423	5608
	Frequent drinker	2.44	1.328	4521
	Total	2.96	1.459	10129
17.j. Drink Alcohol-Look Alike	Non-frequent drinker	1.91	1.132	5608
	Frequent drinker	1.43	.774	4521
	Total	1.70	1.016	10129

Results of the MANOVA test showed a significant difference at the .05 level in personal protective behaviors use between frequent drinking and non-frequent drinkers with a Wilks' Lambda of .822, $F(1,10129) = 218.492$, $p=.000$. The F values of the following personal protective behaviors were significant at the .05 level: Alternate non-alcoholic with alcoholic beverages $F(1,10129) = 171.454$, $p=.000$; determine, in advance, not to exceed a set number of drinks $F(1,10129) = 396.410$, $p=.000$; choose not to drink $F(1,10129)$ 1475.930, $p=.000$; use a designated driver $F(1,10129)$ 102.971, $p=.000$; eat before and/or during drinking $F(1,10129)$ 10.644, $p=.000$; have a friend let you know when you have had enough $F(1,10129)$ 47.952, $p=.000$; keep track of how many drinks you were having $F(1,10129)$429.872, $p=.000$; Pace your drinks to one or fewer per hour $F(1,10129)$ 799.297, $p=.000$; avoid drinking games $F(1,10129)$ 1169.046, $p=.000$; and drink an alcohol look-alike $F(1,10129)$ 1169.046, $p=.000$ (see Table 24).

To further investigate significant differences of alcohol-related personal protective behaviors self-reported used between non-frequent drinkers and frequent drinkers, an ANOVA test was completed. Students could respond to each personal protective behavior by selecting one of the following: Not applicable/don't drink, always, usually, sometimes, rarely, and never. For the purposes of the research study, the researcher included responses of "not applicable" and "never" together, and put the responses on a Likert scale, ranging from 1 (*never*) to 5 (*always*). A higher mean score indicated using protective behaviors more often.

The results of the ANOVA tests found non-frequent drinkers had higher mean personal protective behavior use for every personal protective behavior listed in

comparison to frequent drinkers (See Table 25). Non-frequent drinkers reported that they *sometimes* (3) *to usually* (4) determine, in advance, not to exceed a set number of drinks (M = 3.130, SD = 1.506), choose not to drink alcohol (M = 3.143, SD = .876), and avoid drinking games (M = 3.143, SD = .876), while frequent drinkers reported that they *rarely* (2) *to sometimes* (3) used those personal protective behaviors (M = 2.568, SD 1.287), (M = 2.487, SD = .827), and (M = 2.436, SD = 1.328), respectively. Non-frequent drinkers (M = 4.22, SD 1.247) also reported that they *usually* (4) *to always* (5) use a designated driver compared to frequent drinkers (M = 3.98, SD 1.192) who reported that they *sometimes* (3) *to usually* (4) use a designated driver. Non-frequent drinkers (M = 4.00, SD 1.268) reported that they *usually* (4) keep track of how many drinks they were having and frequent drinkers (M = 3.47, SD 1.296) report that they *sometimes* (3) *to usually* (4) practice that behavior. In other words, non-frequent drinkers reported using these particular alcohol-related personal protective behaviors more often than frequent drinkers (see Figure 5). The means were higher for non-frequent drinkers (M = 2.88, SD 1.293) compared to frequent drinkers (M = 2.55, SD 1.167) in their reports of alternating non-alcoholic with alcoholic beverages, although both groups remained in the *rarely* (2) *to sometimes* (3) range. Similarly, the means were higher for non-frequent drinkers (M = 4.15, SD .954) compared to frequent drinkers (M = 4.09, SD .847) in their reports of eating before and/or during drinking, yet both types of drinkers remained in the *usually* (4) *to always* (5) categories. Non-frequent drinkers reported having a friend let them know when they have had enough (M = 2.71, SD 1.537) and pacing drinks to one or fewer per hour (M = 2.98, SD 1.390), placing them in the *rarely* (2) *to sometimes* (3) category. The means were slightly higher than frequent drinkers who reported having a

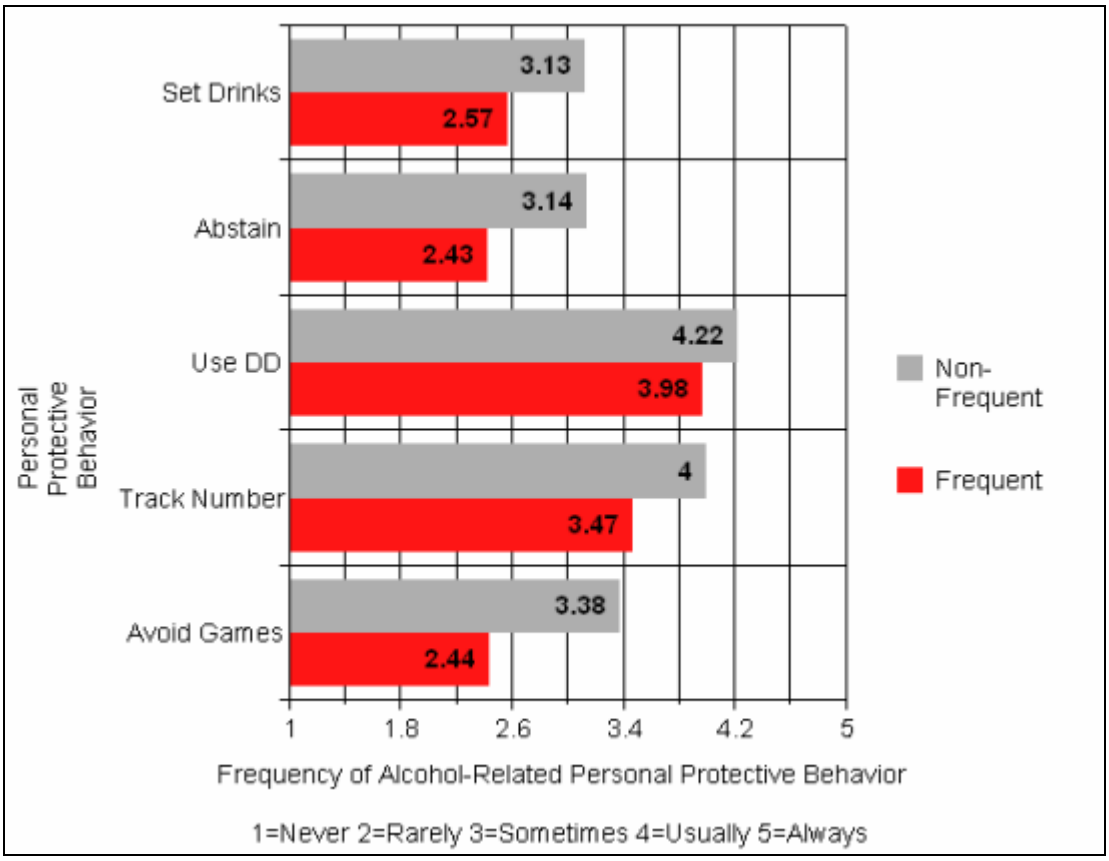

Figure 5. Mean Differences in Frequency of Self-Reported Alcohol-Related Personal Protective Behaviors Between Non-Frequent and Frequent Undergraduate College Student Drinkers in the Southern United States on the 2006 NCHA.

friend let them know when they have had enough (*M* = 2.51, *SD* 1.294) and pacing drinks to one or fewer per hour (*M* = 2.25, *SD* 1.138), but both non-frequent and frequent drinkers remained in the *rarely* (2) *to sometimes* (3) category for both indicators. In addition, the means for non-frequent drinkers (*M* = 1.91, *SD* 1.132) were higher than frequent drinkers (*M* = 1.43, *SD* .774) with regard to drinking alcohol look-alikes, but both groups remained in the *never* (1) *to rarely* (2) category.

4. *Are there significant differences between self-reported binge alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?*

A MANOVA test was also employed to determine if there was a significant difference between non-binge drinkers and binge drinkers and their use of alcohol-related personal protective behaviors (see Table 26). Wilks' Lambda was used to determine

Table 26. MANOVA Results of Binge Drinking Status and Alcohol-Related Personal Protective Behaviors Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions

Dependent Variable	Mean Square	*F*	*p* value
17.a. Alternate Beverages	454.014	299.617	.000*
17.b. Set Number of Drinks	1666.787	873.480	.000*
17.c. Abstain	1100.163	1510.419	.000*
17.d. Use DD	100.228	66.787	.000*
17.e. Eat	45.211	55.097	.000*
17.f. Friend Limit	70.519	34.251	.000*
17.g. Track Number	1645.173	1063.450	.000*
17.h. Pace	3203.935	2191.093	.000*
17.i. Avoid Games	3930.173	2258.438	.000*
17.j. Drink Alcohol Look-Alike	770.797	804.942	.000*

*Significant at the .05 level. *df*=1.

whether there was a significant difference between the two categories and ANOVA tests were used to further examine significant differences (see Table 27).

MANOVA analyses demonstrated a significant difference at the .05 level in personal protective behaviors use between non-binge drinkers and binge drinkers with a Wilks' Lambda of .725, $F(1,10131) = 383.237$, p=000. The F values of each personal protective behavior are found in Table 26. Each of the following F values of alcohol-related personal protective behaviors were significant at the .05 level: Alternate non-alcoholic with alcoholic beverages $F(1,10131) = 299.617$, p=.000; determine, in advance, not to exceed a set number of drinks $F(1,10131) = 873.480$, p=.000; choose not to drink $F(1,10131)$ 1510.419, p=.000; use a designated driver $F(1,10131)$ 66.787, p=.000; eat before and/or during drinking $F(1,10131)$ 55.097, p=.000; have a friend let you know when you have had enough $F(1,10131)$ 34.251, p=.000; keep track of how many drinks you were having $F(1,10131)$ 1063.450, p=.000; Pace your drinks to one or fewer per hour $F(1,10131)$ 2191.093, p=.000; avoid drinking games $F(1,10131)$ 2258.438, p=.000; and drink an alcohol look-alike $F(1,10131)$ 804.942, p=.000 (see Table 27).

To further investigate significant differences of alcohol-related personal protective behaviors self-reported used between non-binge drinkers and binge drinkers, an ANOVA test was completed. Students could respond to each personal protective behavior by selecting one of the following: Not applicable/don't drink, always, usually, sometimes, rarely, and never. For the purposes of the research study, the researcher included responses of "not applicable" and "never" together, and put the responses on a Likert scale, ranging from 1 (*never*) to 5 (*always*). A higher mean score indicated more frequent use of alcohol-related protective behaviors.

Table 27. ANOVA Results of Binge Drinking Status and Alcohol-Related Personal Protective Behaviors Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Dependent Variable	Binge Status	Mean	Std. Deviation	N
17.a. Alternate Beverages	Non-binge drinker	2.98	1.325	4269
	Binge drinker	2.55	1.158	5862
	Total	2.73	1.249	10131
17.b. Set Number of Drinks	Non-binge drinker	3.35	1.519	4269
	Binge drinker	2.53	1.272	5862
	Total	2.88	1.440	10131
17.c. Abstain	Non-binge drinker	3.24	.849	4269
	Binge drinker	2.57	.856	5862
	Total	2.85	.915	10131
17.d. Use DD	Non-binge drinker	4.23	1.268	4269
	Binge drinker	4.03	1.192	5862
	Total	4.11	1.229	10131
17.e. Eat	Non-binge drinker	4.20	.949	4269
	Binge drinker	4.06	.873	5862
	Total	4.12	.908	10131
17.f. Friend Limit	Non-binge drinker	2.72	1.587	4269
	Binge drinker	2.55	1.313	5862
	Total	2.62	1.437	10131
17.g. Track Number	Non-binge drinker	4.24	1.182	4269
	Binge drinker	3.42	1.287	5862
	Total	3.77	1.307	10131
17.h. Pace	Non-binge drinker	3.31	1.380	4269
	Binge drinker	2.17	1.068	5862
	Total	2.65	1.334	10131
17.i. Avoid Games	Non-binge drinker	3.69	1.348	4269
	Binge drinker	2.43	1.298	5862
	Total	2.96	1.459	10131
17.j. Drink Alcohol-Look Alike	Non-binge drinker	2.02	1.168	4269
	Binge drinker	1.46	.813	5862
	Total	1.70	1.017	10131

Results of the ANOVA analysis found non-binge drinkers had higher mean personal protective behavior use than binge drinkers for each alcohol-related personal protective behaviors (see Table 27). Non-binge drinkers reported that they *usually* (4) *to always* (5) keep track of how many drinks they were having (M = 4.237, SD = 1.182), while binge drinkers reported that they *sometimes* (3) *to usually* (4) use this personal protective behavior (M = 3.421, SD = 1.287). Non-binge drinkers reported *sometimes* (3) *to usually* (4) pace drinks to one or fewer per hour (M = 3.311, SD = 1.380), and avoid drinking games (M = 3.688, SD = 1.348). They use these personal protective behaviors more often than binge drinkers who reported that they *rarely* (2) to *sometimes* (3) pace drinks to one or fewer per hour (M = 2.172, SD = 1.068) and avoid drinking games (M =2.426, SD = 1.298). Non-binge drinkers reported that they *sometimes* (3) *to usually* (4) determine, in advance, not to exceed a set number of drinks (M = 3.35, SD = 1.519) and choose not to drink alcohol (M = 3.24, SD = .849), while students who report binge drinking reported that they *rarely* (2) *to sometimes* (3) used those personal protective behaviors (M = 2.53, SD 1.272) and (M = 2.57, SD = .856), respectively. Non-binge drinkers (M = 2.02, SD = 1.168), reported that they *rarely* (2) *to sometimes* (3) drink an alcohol look-alike while binge drinkers (M = 1.46, SD = .813) reported that they *never* (1) *to rarely* (2) used that protective behavior. In other words, non-binge drinkers reported using these particular alcohol-related personal protective behaviors more often than binge drinkers (see Figure 6). Non-binge drinkers (M = 4.20, SD .949) had higher means compared to binge drinkers (M = 4.06, SD .873) in their reports of eating before and/or during drinking, yet both types of drinkers remained in the *usually* (4) *to always* (5) categories. While the mean for non-binge drinkers was slightly higher, both non-

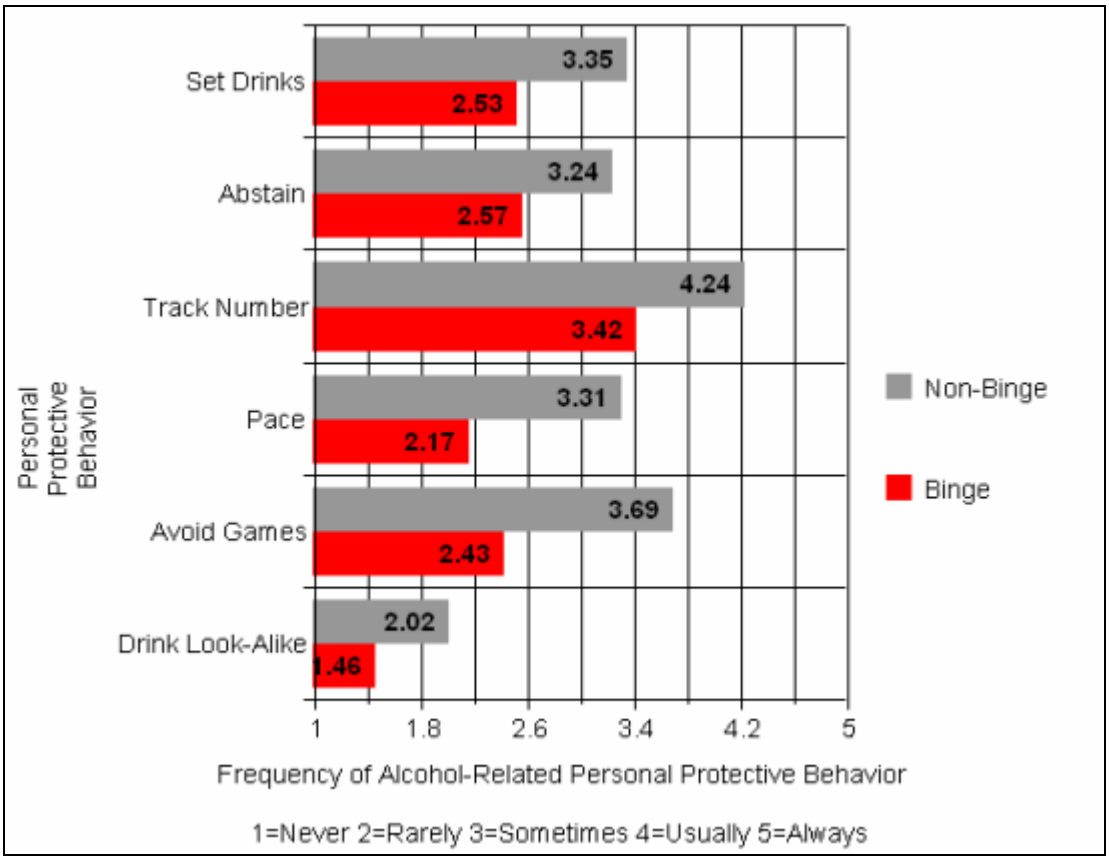

Figure 6. Mean Differences in Frequency of Self-Reported Alcohol-Related Personal Protective Behaviors Between Non-Binge and Binge Undergraduate College Student Drinkers in the Southern United States on the 2006 NCHA.

binge drinkers (*M* = 4.23, *SD* 1.268) and binge drinkers (*M* = 4.03, *SD* 1.192) reported that they *usually* (4) to *always* (5) used a designated driver. Non-binge drinkers reported having a friend let them know when they have had enough (*M* = 2.72, *SD* 1.587) and alternating non-alcoholic with alcoholic beverages (*M* = 2.98, *SD* 1.325) *rarely* (2) *to sometimes* (3). Non-binge drinker means were slightly higher than binge drinkers with regard to having a friend let them know when they have had enough (*M* = 2.55, *SD* 1.313) and alternating non-alcoholic with alcoholic beverages (*M* = 2.55, *SD* 1.158), but the binge drinkers still fell into the *rarely* (2) *to sometimes* (3) category.

5. *What is the relationship between the frequency of self-reported alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?*

There were seven alcohol-related health consequences listed in question 18 on the NCHA. Students could select "no" or "yes" to indicate whether had experienced any of the consequences as a result of their drinking in the last school year. Students could also select "not applicable/don't drink" (these students were not included in the current analysis). Chi-square tests were performed to determine the relationship between the frequency of self-reported alcohol and each of the seven alcohol-related health consequences. The significance level used was .05. See Table 28 for a summary of chi-square results. When significant differences were found, adjusted residuals were obtained. Adjusted residuals of +2 or –2 were considered significant. See Figure 7 for a summary of adjusted residual results.

Results of each chi-square analyses produced significant results at the .05 level, showing a significant relationship between non-frequent and frequent drinkers in regard to their reports of experiencing each alcohol-related health consequence listed in question

Table 28. Summary of Chi-Square Results of Frequency of Drinking and Alcohol-Related Consequences Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Dependent Variable	*n*	$\chi^2(1)$	*p* value
Injure Self	10998	973.658	.000*
Injure Another	10997	245.014	.000*
Fight	10997	335.940	.000*
Regret	10982	889.773	.000*
Forget	10978	1132.229	.000*
Force Sex	10985	28.347	.000*
Unprotected Sex	10969	442.587	.000*

*Significant at the .05 level.

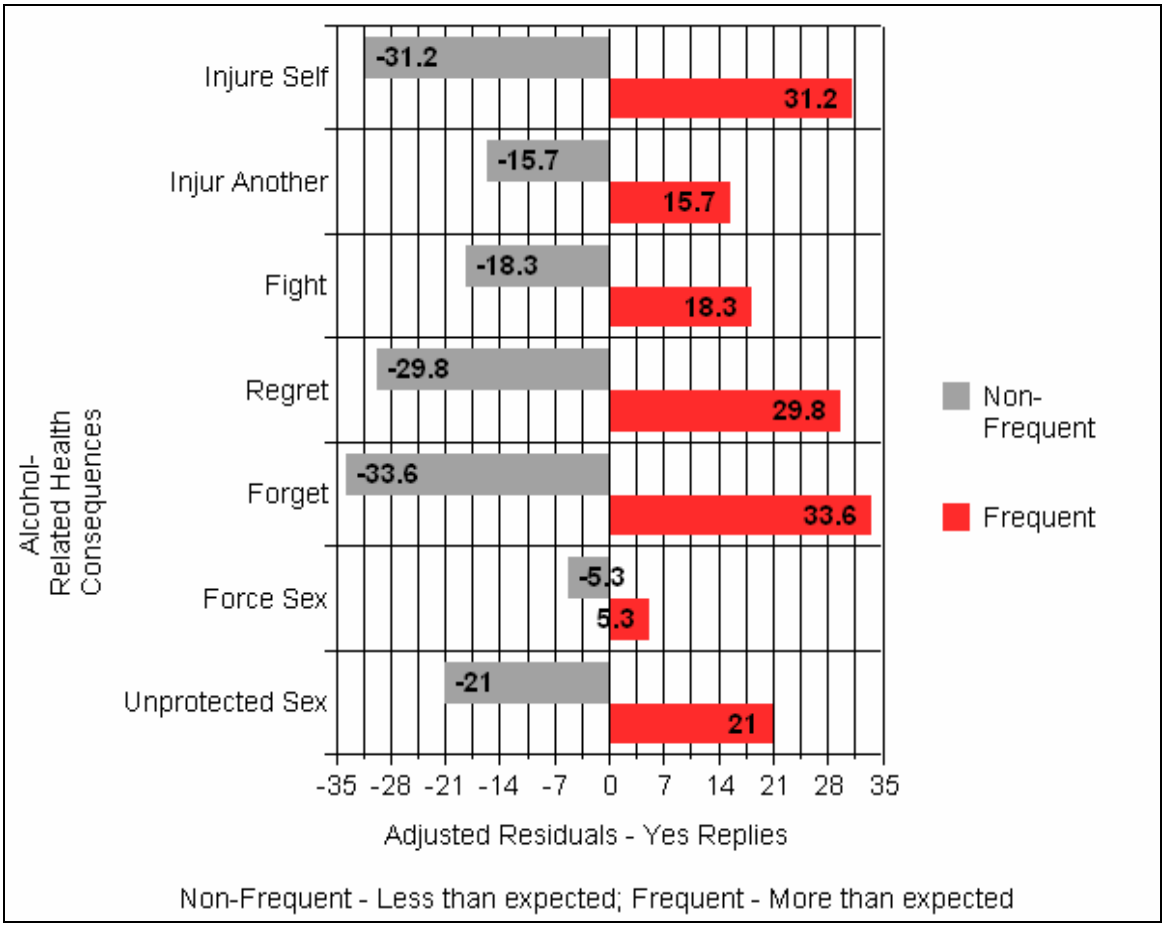

Figure 7. Summary of Adjusted Residual Results: Alcohol-Related Health Consequences Self-Reported By Non-Frequent and Frequent Undergraduate College Student Drinkers in the Southern United States on the 2006 NCHA.

18 (see Table 28). A chi-square test was used to examine the relationship between the frequency of drinking and "physical injury of self." The chi-square result, significant at the .05 level, was $\chi^2 = 973.658$, $df = 1$, $p = .000$. Cross tabulations showed that 1,566 (32.6%) frequent drinkers and 552 (8.9%) non-frequent drinkers reported injuring themselves. The adjusted residual for non-frequent drinkers (–31.2) who injured themselves was significant, indicating that the observed count of reports of self-injury among non-frequent drinkers was less than expected (see Table 29). The adjusted residual for frequent drinkers (+31.2) was also significant, indicating that the observed count of frequent drinkers reporting self-injury was more than expected.

Table 29. Cross Tabulation Results of Drinking Frequency and Self-Injury Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Injure Self		Total
		no	yes	
Non-frequent drinker	Count	5638	552	6190
	% within Drinking Frequency	91.1%	8.9%	100.0%
	Adjusted Residual	31.2*	-31.2*	
Frequent drinker	Count	3242	1566	4808
	% within Drinking Frequency	67.4%	32.6%	100.0%
	Adjusted Residual	-31.2*	31.2*	
Total	Count	8880	2118	10998
	%	80.7%	19.3%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

To observe the relationship between frequency of drinking and "physically injuring another person" the chi-square test was used. The chi-square analysis produced significant results at the .05 level ($\chi^2 = 245.0414$, $df = 1$, $p = .000$). Cross tabulations showed that more frequent drinkers (396; 8.2%) than non-frequent drinkers (117; 1.9%) reported injuring another person as a consequence of their drinking. Significant adjusted residuals showed that the count of non-frequent drinkers (–15.7) who injured another person was less than the count expected and the count for frequent drinkers (+15.7) was more than the count expected (see Table 30).

The chi-square test was also employed to examine the relationship between frequency of self-reported drinking and "been involved in a fight." Results of the chi-

Table 30. Cross Tabulation Results of Drinking Frequency and Injury of Another Person Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Injure Another		Total
		no	yes	
Non-frequent drinker	Count	6072	117	6189
	% within Drinking Frequency	98.1%	1.9%	100.0%
	Adjusted Residual	15.7*	-15.7*	
Frequent drinker	Count	4412	396	4808
	% within Drinking Frequency	91.8%	8.2%	100.0%
	Adjusted Residual	-15.7*	15.7*	
Total	Count	10484	513	10997
	%	80.7%	4.7%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

Table 31. Cross Tabulation Results of Drinking Frequency and Involvement in a Fight Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Fighting		Total
		no	yes	
Non-frequent drinker	Count	6015	173	6188
	% within Drinking Frequency	97.2%	2.8%	100.0%
	Adjusted Residual	18.3*	-18.3*	
Frequent drinker	Count	4253	556	4809
	% within Drinking Frequency	88.4%	11.6%	100.0%
	Adjusted Residual	-18.3*	18.3*	
Total	Count	10268	729	10997
	%	93.4%	6.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

square test were significant at the .05 level ($\chi^2 = 335.940$, $df = 1$, $p = .000$). Cross tabulations showed that more frequent drinkers (556; 11.6%) than non-frequent drinkers (173; 2.8%) reported being involved in a fight as a result of drinking alcohol. Adjusted residuals were significant and showed that fewer non-frequent drinkers (–18.3) and more frequent drinkers (+18.3) reported being in a fight than was statistically expected (see Table 31).

In addition, a chi-square test also produced significant results at the .05 level in examining frequency of drinking and "doing something they regretted later" ($\chi^2 = 889.773$, $df = 1$, $p = .000$). A larger number of frequent drinkers (2,518; 52.4%) than

non-frequent drinkers (1,529; 24.7%) reported doing something they later regretted. The observed count of non-frequent drinkers who reported doing something they later regretted as a consequence of their drinking was less than expected as shown by a significant adjusted residual of –29.8 (see Table 32). The significant adjusted residual for frequent drinkers (+29.8) demonstrated that the observed count of frequent drinkers reporting regrettable action was more than expected.

Chi-square analysis was used to examine the relationship between frequency of drinking and "forgetting where one was or what one did." The results of the chi-square test were significant at the .05 level ($\chi^2 = 1132.229$, $df = 1$, $p = .000$). Cross tabulations showed that the number of frequent drinkers (2,332; 48.6%) who reported forgetting

Table 32. Cross Tabulation Results of Drinking Frequency and Regrettable Action Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Regret		Total
		no	yes	
Non-frequent drinker	Count	4650	1529	6179
	% within Drinking Frequency	75.3%	24.7%	100.0%
	Adjusted Residual	29.8*	-29.8*	
Frequent drinker	Count	2285	2518	4803
	% within Drinking Frequency	47.6%	52.4%	100.0%
	Adjusted Residual	-29.8*	29.8*	
Total	Count	6935	4047	10982
	%	63.1%	36.9%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

where they were or what they did as a consequence of their drinking was larger than the number of non-frequent drinkers (1,142; 18.5%). Significant adjusted residuals showed that the count of non-frequent drinkers (–33.6) was under-represented and the count for frequent drinkers (+33.6) was over-represented compared to the count expected (see Table 33).

In addition, the chi-square test was completed to examine the relationship between frequency of drinking and "had someone use force or threat of force to have sex with you." The result of the chi-square test was significant at the .05 level ($\chi^2 = 28.347$, $df = 1$, $p = .000$). Cross tabulations showed that more frequent drinkers (109; 2.3%) than non-frequent drinkers (62; 1.0%) reported this alcohol-related health consequence. Adjusted residuals were significant and showed that fewer non-frequent drinkers (–5.3)

Table 33. Cross Tabulation Results of Drinking Frequency and Forgetting Where or What Student Did Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Forget		Total
		no	yes	
Non-frequent drinker	Count	5037	1142	6179
	% within Drinking Frequency	81.5%	18.5%	100.0%
	Adjusted Residual	33.6*	-33.6*	
Frequent drinker	Count	2467	2332	4799
	% within Drinking Frequency	51.4%	48.6%	100.0%
	Adjusted Residual	-33.6*	33.6*	
Total	Count	7504	3474	10978
	%	68.4%	31.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

and more frequent drinkers (+5.3) reported having someone use force or threat of force to have sex with them than was statistically expected (see Table 34).

To examine the relationship between frequent drinking and "having unprotected sex," a chi-square test was employed and produced significant results (χ^2 =442.578, *df* =1, *p* =.000). Cross tabulations showed that a larger number of frequent drinkers (1,202; 25.1%) than non-frequent drinkers (618; 10.0%) reported being having unprotected sex as a result of drinking alcohol. Significant adjusted residuals produced showed that the count of non-frequent drinkers (–21.0) was under-represented and the count for frequent drinkers (+21.0) was over-represented compared to the count expected to report having

Table 34. Cross Tabulation Results of Drinking Frequency and Force or Threat of Force For Sex Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Force Sex		Total
		no	yes	
Non-frequent drinker	Count	6122	62	6184
	% within Drinking Frequency	99.0%	1.0%	100.0%
	Adjusted Residual	5.3*	-5.3*	
Frequent drinker	Count	4692	109	4801
	% within Drinking Frequency	97.7%	2.3%	100.0%
	Adjusted Residual	-5.3*	5.3*	
Total	Count	10814	171	10985
	%	98.4%	1.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

unprotected sex (see Table 35).

6. *What is the relationship between self-reported binge alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?*

Chi-square analyses were also performed to determine the relationship between binge drinking and each of the seven alcohol-related health consequences. The significance level used was .05. Cross tabulations were conducted to obtain adjusted residuals and examine significant differences. Adjusted residuals of +2 or –2 were considered significant. Results of the chi-square test analyses are reported in Table 36. A summary of adjusted residual results is shown in Figure 8.

Table 35. Cross Tabulation Results of Drinking Frequency and Unprotected Sex Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Unprotected Sex		Total
		no	yes	
Non-frequent drinker	Count	5557	618	6175
	% within Drinking Frequency	90.0%	10.0%	100.0%
	Adjusted Residual	21.0*	-21.0*	
Frequent drinker	Count	3592	1202	4794
	% within Drinking Frequency	74.9%	25.1%	100.0%
	Adjusted Residual	-21.0*	21.0*	
Total	Count	9149	1820	10969
	%	83.4%	16.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

Table 36. Summary of Chi-Square Results of Binge Drinking Status and Alcohol-Related Health Consequences Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Dependent Variable	*n*	$\chi^2(1)$	*p* value
Injure Self	10998	988.481	.000*
Injure Another	10997	242.899	.000*
Fight	10997	328.784	.000*
Regret	10982	1121.253	.000*
Forget	10978	1540.838	.000*
Force Sex	10985	17.999	.000*
Unprotected Sex	10970	458.808	.000*

*Significant at the .05 level.

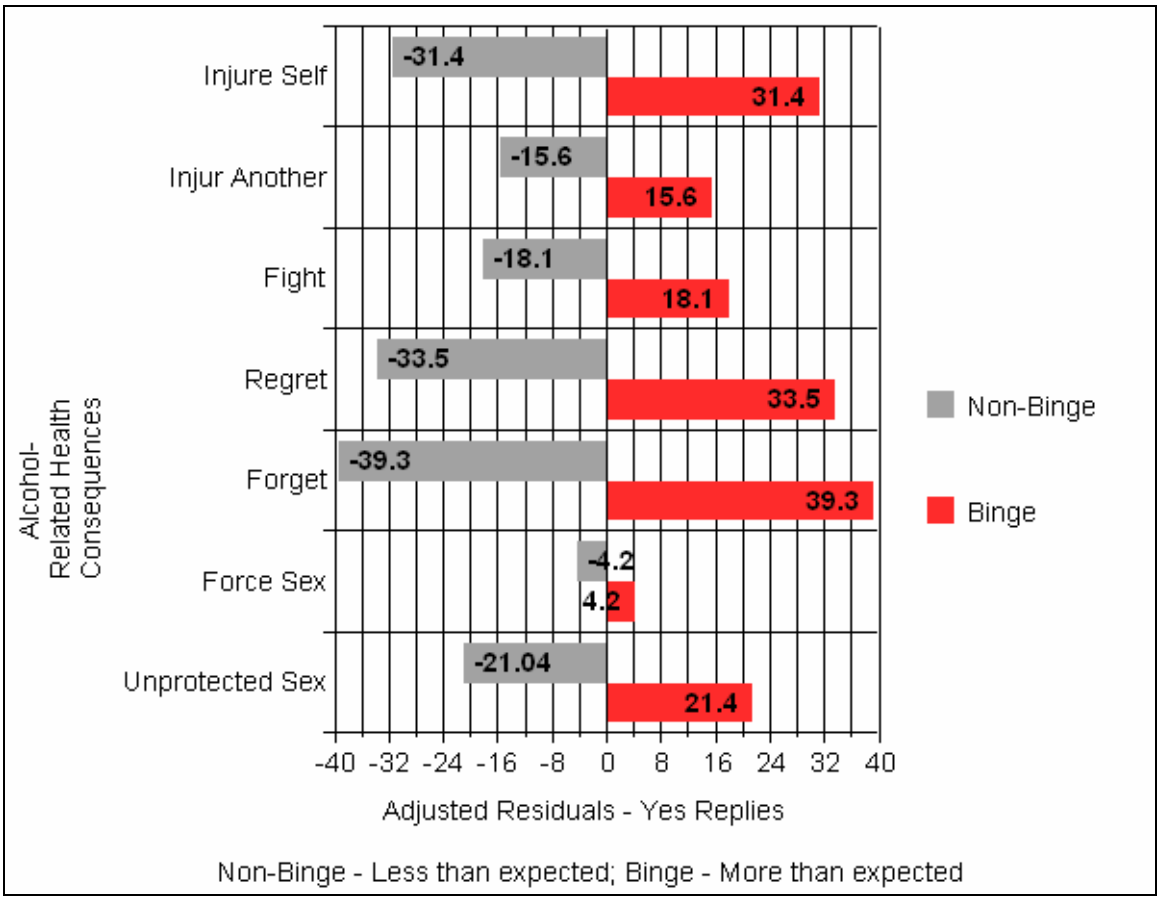

Figure 8. Summary of Adjusted Residuals Results: Alcohol-Related Health Consequences Self-Reported By Non-Binge and Binge Undergraduate College Student Drinkers in the Southern United States on the 2006 NCHA.

A chi-square test was employed to examine the relationship between binge drinking and "physically injured yourself." Results were significant at the .05 level (χ^2 = 988.481, *df* = 1, *p* = .000). Cross tabulations showed that more binge drinkers (1,843; 29.6%) than non-binge drinkers (276; 5.8%) reported physically injuring themselves as a consequence of drinking alcohol. Cross tabulations produced a significant adjusted residual of –31.4 for non-binge drinkers, meaning that the observed count of non-binge drinkers who reported physical self-injury was less than expected (see Table 37). The adjusted residual for binge drinkers (+31.4) was also significant, showing that the observed count of binge drinkers reporting that they had hurt themselves was more than expected.

Table 37. Cross Tabulation Results of Binge Drinking Status and Self-Injury Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Injure Self		Total
		no	yes	
Non-binge drinker	Count	4502	276	4778
	% within Binge Status	94.2%	5.8%	100.0%
	Adjusted Residual	31.4*	-31.4*	
Binge drinker	Count	4377	1843	6220
	% within Binge Status	70.4%	29.6%	100.0%
	Adjusted Residual	-31.4*	31.4*	
Total	Count	8879	2119	10998
	%	80.7%	19.3%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

Chi-square analysis was also completed to examine the relationship between binge drinking and "physically injuring another person," producing significant results at the .05 level ($\chi^2 = 242.899$, $df = 1$, $p = .000$). Cross tabulations showed that a larger number of binge drinkers (461; 7.4%) reported physically injuring another person as a result of drinking alcohol than non-binge drinkers (52; 1.1%). Significant adjusted residuals showed that the count of non-binge drinkers (–15.6) was under-represented and the count for binge drinkers (+15.6) were over-represented compared to the count expected in reporting injury of another person (see Table 38).

To examine the relationship between binge drinking and "been involved in a fight," the chi-square test was used. The results of the chi-square analysis produced

Table 38. Cross Tabulation Results of Binge Drinking Status and Injury of Another Person Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Injure Another		Total
		no	yes	
Non-binge drinker	Count	4725	52	4777
	% within Binge Status	98.9%	1.1%	100.0%
	Adjusted Residual	15.6*	-15.6*	
Binge drinker	Count	5759	461	6220
	% within Binge Status	92.6%	7.4%	100.0%
	Adjusted Residual	-15.6*	15.6*	
Total	Count	10484	513	10997
	%	95.3%	4.7%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

significant results at the .05 level ($\chi^2 = 328.784$, $df = 1$, $p = .000$). More binge drinkers (647; 10.4%) than non-binge drinkers (82; 1.7%) reported being in a fight as a result of drinking alcohol. Adjusted residuals were significant and showed that fewer non-binge drinkers (–18.1) and more binge drinkers (+18.1) reported being in a fight than was statistically expected (see Table 39).

In addition, a chi-square test was used to test the relationship between binge drinking and "doing something they regretted later." The results of the chi-square test were significant at the .05 level ($\chi^2 = 1121.253$, $df = 1$, $p = .000$). Cross tabulations showed a larger number of binge drinkers (3,130; 50.3%) reported doing something they later regretted as a result of drinking alcohol than non-binge drinkers (917; 19.2%). A

Table 39. Cross Tabulation Results of Binge Drinking Status and Involvement in a Fight Reported on the 2006 NCHA By Undergraduate Students Enrolled in United States Institutions.

Category of Drinker	Count	Fighting		Total
		no	yes	
Non-binge drinker	Count	4692	82	4774
	% within Binge	98.3%	1.7%	100.0%
	Adjusted Residual	18.1*	-18.1*	
Binge drinker	Count	5576	647	6223
	% within Binge	89.6%	10.4%	100.0%
	Adjusted Residual	-18.1*	18.1*	
Total	Count	10268	729	10997
	%	93.4%	6.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

significant adjusted residual for non-binge drinkers (–33.5) showed that this group was under-represented in comparison to the count expected (see Table 40). The significant adjusted residual for binge drinkers (+33.5) showed that binge drinkers were over-represented compared to the expected count.

The chi-square test was also completed to examine the relationship between binge drinking and "forgot where you were or what you did," producing significant results at the .05 level ($\chi^2 = 1540.838$, $df = 1$, $p = .000$). More binge drinkers (2913; 46.9%) than non-binge drinkers (561; 11.8%) reported forgetting where they were or what they did as a result of consuming alcohol. Adjusted residuals were significant and showed that fewer non-binge drinkers (–39.3) and more binge drinkers (+39.3) reported forgetting where they were or what they did than the count statistically expected (see Table 41).

Chi-square analysis was also used to examine the relationship between binge drinking and "had someone use force or threat of force to have sex with you." The chi-square analysis produced significant results at the .05 level ($\chi^2 = 17.999$, $df = 1$, $p = .000$). Cross tabulations showed that a larger number of binge drinkers (124; 2.0%) than non-binge drinkers (47; 1.0%) reported having someone use force or threat of force to have sex with them as a result of drinking alcohol. Adjusted residuals were significant and showed fewer non-binge drinkers (–4.2) and more binge drinkers (+4.2) reported force of sex or threat of force sex than statistically expected (see Table 42).

Lastly, to examine the relationship between binge drinking and "had unprotected sex," the chi-square test was used. The results of the chi-square analysis were significant at the .05 level ($\chi^2 = 458.808$, $df = 1$, $p = .000$). More binge drinkers (1,443; 23.3%)

Table 40. Cross Tabulation Results of Binge Drinking Status and Regrettable Action Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Regret		Total
		no	yes	
Non-binge drinker	Count	3848	917	4765
	% within Binge	80.8%	19.2%	100.0%
	Adjusted Residual	33.5*	-33.5*	
Binge drinker	Count	3087	3130	6217
	% within Binge	49.7%	50.3%	100.0%
	Adjusted Residual	-33.5*	33.5*	
Total	Count	6935	4047	10982
	%	63.1%	36.9%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

Table 41. Cross Tabulation Results of Binge Drinking Status and Forgetting Where or What Student Did Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Forget		Total
		no	yes	
Non-binge drinker	Count	4202	561	4769
	% within Binge	88.2%	11.8%	100.0%
	Adjusted Residual	39.3*	-39.3*	
Binge drinker	Count	3296	2913	6209
	% within Binge	53.1%	46.9%	100.0%
	Adjusted Residual	-39.3*	39.3*	
Total	Count	7504	3474	10978
	%	68.4%	31.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

Table 42. Cross Tabulation Results of Binge Drinking Status and Force or Threat of Force for Sex Reported on the 2006 NCHA By Undergraduate Students Enrolled in United States Institutions.

Category of Drinker	Count	Force Sex		Total
		no	yes	
Non-binge drinker	Count	4725	47	4772
	% within Binge	99.0%	1.0%	100.0%
	Adjusted Residual	4.2*	-4.2*	
Binge drinker	Count	6089	124	6213
	% within Binge	98.0%	2.0%	100.0%
	Adjusted Residual	-4.2*	4.2*	
Total	Count	10814	171	10985
	%	98.4%	1.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant.

reported having unprotected sex as a result of drinking alcohol than non-binge drinkers (378; 7.9%). Significant adjusted residuals showed that the count of non-binge drinkers (–21.4) was under-represented and the count for binge drinkers (+21.4) was over-represented compared to the count expected to report having unprotected sex (see Table 43).

Summary of Descriptive Results

Demographics

1. Data from 117 institutions and 94,806 students were included in the Spring 2006 NCHA database.

Table 43. Cross Tabulation Results of Binge Drinking Status and Unprotected Sex Reported on the 2006 NCHA By Undergraduate Students Enrolled in Southern United States Institutions.

Category of Drinker	Count	Force Sex		Total
		no	yes	
Non-binge drinker	Count	4392	378	4770
	% within Binge	92.1%	7.9%	100.0%
	Adjusted Residual	21.4*	-21.4*	
Binge drinker	Count	4757	1443	6200
	% within Binge	76.7%	23.3%	100.0%
	Adjusted Residual	-21.4*	21.4*	
Total	Count	9149	1821	10970
	% within Binge	83.4%	16.6%	100.0%

*An adjusted residual of less than –2 or more than +2 was considered to be significant. Those found between –2 and +2 were not significant

2. Of 117 institutions, 26 institutions (about 21%) that participated in the NCHA were in the South.

3. There were 19,590 respondents enrolled in Southern institutions who participated in the Spring 2006 NCHA.

4. The study analyzed data from 14,540 undergraduate students in years one to five of undergraduate study, enrolled in Southern institutions, which completed the NCHA in Spring 2006.

5. Of the undergraduate Southern student sample of 14,540 students, 9,230 (64.9%) were female.

6. Of 14,540 undergraduate students in the sample, 4,986 (35.1%) were male.

7. There were 10,384, (71.4 %) who described themselves as White in the research study sample.

8. There were 4,156 (28%) non-White undergraduate students in the research study sample. (See Table 10).

9. The sample was comprised of 3,766 (25.9%) first year undergraduate students.

10. There were 3,601 (24.8%) second year undergraduate student respondents.

11. There were 3,440 (23.7%) students who indicated they were in their third year of undergraduate study.

12. The sample was comprised of 2,816 (19.4%) fourth year undergraduate students.

13. There were 917 (6.3%) fifth year undergraduate students in the research study sample.

Types of Alcohol Drinkers Findings

14. Of 14,540 students, 9,647 (66.4%) reported non-frequent drinking.

15. There were 4876 (33.6%) frequent drinkers in the study sample.

16. Of the sample, 8,172 (56.7%) respondents reported that they did not binge drink.

17. There were 6,330 (43.6%) of respondents who self-reported binge drinking.

Alcohol-Related Personal Protective Behavior

18. There were 2,558 (23.3%) of student respondents who reported that they always alternate non-alcoholic with alcoholic beverages during the last school year if they partied/socialized.

19. There were 2,882 (26.6%) respondents who self-reported usually alternating non-alcoholic with alcoholic beverages in the last school year if they partied/socialized.

20. Of 10,961 students who responded, 2,161 (19.7%) reported that if they partied/socialized in the last school year, they sometimes alternate non-alcoholic with alcoholic beverages.

21. There were 1,055 (9.6%) students who self-reported that they rarely alternate non-alcoholic with alcoholic beverages in the last school year if they partied/socialized.
22. There were 2,305 (21.0%) students who responded not applicable or never to alternating non-alcoholic with alcoholic beverages.

23. There were 1,899 (17.3%) students who self-reported always determining, in advance, not to exceed a set number of drinks during the last school year if they partied/socialized.

24. There were 2,213 respondents that reported that if partying/socializing in the last school year that they usually determined, in advance, not to exceed a set number of drinks.

25. Of 10,963 students who responded, 2,038 (18.6%) reported that if they partied/socialized in the last school year, they sometimes alternate non-alcoholic with alcoholic beverages.

26. There were 2,073 (18.9%) of students who reported that they rarely determined, in advance, not to exceed a set number of drinks during the last school year if they partied/socialized.

27. There were 2,740 (25.0%) students who responded not applicable or never to determining not to exceed a set number of drinks during the last school year if they partied/socialized.

28. There were 2,154, (18.3%) of students reported that they always choose not to drink alcohol if they partied/socialized in the last school year.

29. There were 5,275 (44.9%) respondents who self-reported that if they partied/socialized in the last school year, they usually chose not to drink alcohol.

30. Of 11,739 respondents, 2,302 (19.6%) reported sometimes choosing not to drink alcohol during the school year if they partied/socialized.

31. There were 971 (8.3%) students who self-reported rarely choosing not to drink alcohol if they partied/socialized during the last school year.

32. There were 1,037 (8.8%) that responded not applicable or never to choosing not to drink alcohol during the school year if they partied/socialized.

33. Of 10,783 students who responded, 480 (4.5%) reported that they always used a designated driver if they partied/socialized during the last school year.

34. There were 1213 (11.2%) respondents who reported that they usually use a designated driver if they partied/socialized during the last school year.

35. There were 2305 (21.4%) of respondents that self-reported that if they partied/socialized during the last school year, they used a designated driver sometimes.

36. Of 10,783 students who responded, 5960, (55.3%) reported that they rarely used a designated driver if they partied/socialized during the last school year.

37. There were 825 (7.7%) of students who responded not applicable or never to using a designated driver if they partied/socialized during the last school year.

38. With regard to eating before and/or during drinking, 329 (3.0%) students reported that they always practice the behavior if they partied/socialized during the last school year.

39. There were 1,823 (16.6%) respondents who reported that they usually eat before and/or during drinking if they partied/socialized during the last school year.

40. Of 10,998 respondents, 4,239 (38.5%) of students reported that if they partied/socialized in the last school year, they sometimes ate before and/or during drinking.

41. There were 4,395 (40%) of respondents who reported that they rarely eat before and/or during drinking if they partied/socialized in the last school year.

42. With regard to eating before and/or during drinking, 212 (1.9%) of respondents responded not applicable or never.

43. With regard to having a friend let you know when you have had enough, 2,241 (20.7%) students reported always using the practice if they partied/socialized during the last school year.

44. Of 10,808 respondents, 1,876 (17.4%) reported usually having a friend let them know when they have had enough if they partied/socialized during the last school year.

45. There were 1,663 (15.4%) respondents who reported that if they partied/socialized in the last school year, they sometimes have a friend let you know when you have had enough.

46. There were 1,628 (15.1%) students who self-report that they rarely have a friend let you know when you have had enough if they partied/socialized during the last school year.

47. There were 3,400 (31.5%) who responded not applicable or never to having a

friend let you know when you have had enough if they partied/socialized during the last school year

48. There were 1,217 (11.1%) of students who self-reported that they always kept track of the number of drinks they were having if they partied/socialized in the last school year.

49. Of 10,924 students who responded, 1,646 (15%) respondents who reported that they usually kept track of the number of drinks they were having if they partied/socialized in the last school year.

50. There were 2,696 (24.7%) respondents who reported that they sometimes keep track of the number of drinks that they are having if they partied/socialized in the last school year.

51. There were 4,439 (40.6%) of students indicated that if they partied/socialized in the last school year, they rarely keep track of the number of drinks that they are having.

52. There were 926 (8.5%) students who reported not applicable or never to keeping track of the number of drinks that they are having if they partied/socialized in the last school year.

53. There were 2,705 (24.8%) respondents who reported that they always pace their drinks to one or fewer per hour if they partied/socialized in the last school year.

54. With regard to pacing drinks to one or fewer per hour if they partied/socialized in the last school year, 2,384 (21.9%) students reported that they usually practice the protective behavior.

55. The number of students who reported sometimes pacing their drinks to one or fewer per hour if they partied/socialized in the last school year was 1,682 (15.4%).

56. Of 10,888 respondents, 1,400 (12.9%) students reported that they rarely paced their drinks to one or fewer per hour if they partied/socialized in the last school year.

57. There were 2,717 (25%) responded either not applicable or never to pacing their drinks to one or fewer per hour if they partied/socialized in the last school year.

58. Of 11,027 students who responded, 2,189 (19.9%) students reported that they always avoid drinking games if they partied/socialized in the last school year.

59. There were 2,059 (18.7%) students that self-reported usually using practice of avoiding drinking games if they partied/socialized in the last school year.

60. There were 1,782 (16.2%) respondents reported that if they partied/socialized in the last school year, they sometimes avoid drinking games.

61. There were 2,636 (23.9%) students who self-reported that they rarely avoid drinking games if they partied/socialized in the last school year.

62. There were 2,361 (21.4%) who responded not applicable or never with regard to avoiding drinking games if they partied/socialized in the last school year.

63. The number of students who reported always drinking an alcohol look-alike if they partied/socialized in the last school year was 1,928 (17.4%).

64. There were 1,702 (15.3%) students who reported usually drinking an alcohol look-alike if they partied/socialized in the last school year.

65. There were 561 (5.0%) students who reported sometimes drinking an alcohol look-alike if they partied/socialized in the last school year.

66. Of 11,112 respondents, 289 (2.6%) reported rarely drinking an alcohol look-alike if they partied/socialized in the last school year.

67. There were 6,632 responded not applicable or never to drinking an alcohol look-alike if they partied/socialized in the last school year.

Alcohol-Related Health Consequences

68. Of the students who reported that they drank alcohol, 2,120 (19.3%) reported physically injuring themselves as a result of drinking in the last school year.

69. There were 513 (4.7%) students who reported drinking and injuring another person in the last school year as a result of drinking alcohol.

70. Of 11,005 respondents, 729 (6.6%) reported being involved in a fight as a consequence of drinking alcohol in the last school year.

71. There were 4,049 (36.8%) respondents that self-reported doing something they later regretted in the last school year as a result of drinking alcohol.

72. Of the students who reported that they drank alcohol, 3,476 (31.6%) students reported forgetting where they were or what they did in the last school year.

73. There were 171 (1.6%) respondents who reported having someone use force or threat of force to have sex with them in the last school year as a consequence of drinking alcohol.

74. There were 1,821 (16.6%) students who reported that if they drank alcohol in the last school year, that they had unprotected sex as a result of their alcohol drinking.

75. Of the students who reported drinking alcohol, there were 8,886 (80.7%) students who reported they had not injured themselves as a result of drinking alcohol in the last school year.

76. Of 11,005 respondents who drink alcohol, 10,492 (95.3%) reported they did not injure another person as a consequence of their drinking in the last school year.

77. There were 10,276 (93.4%) students who self-reported they were not involved in a fight in the last school year as a result of drinking alcohol.

78. There were 6,941 (63.2%) respondents who reported they had not done something they later regretted as a result of their drinking in the last school year.

79. Of 10,986 respondents, 7,510 (68.4%) reported that they had not forgotten where they were or what they did in the last school year as a consequence of their drinking.

80. There were 10,822 (98.4%) respondents that reported "no" to having someone use force or threat of force to have sex with them in the last school year as a result of drinking alcohol.

81. There were 9,156 (83.4%) respondents that self-reported that they had not had unprotected sex in the last school year as a consequence of drinking.

Summary

This chapter provided the results of the statistical analysis of the research study. A description of the statistical analysis of the demographic information, types of alcohol drinkers, and alcohol-related personal protective behaviors, and health consequences were discussed. Chi-square tests were completed and found significant relationships between the frequency of self-reported alcohol drinking by college students in the

Southern United States and the college student demographic characteristics such as gender, race, and year in college. Frequent drinkers were more likely to be male, White and in their third or fourth year of undergraduate study. Non-frequent drinkers were more likely to be female, non-White and in there first or second year of undergraduate study. Chi-square tests also found significant relationships between the self-reported binge alcohol drinking by college students in the Southern United States and demographic characteristics such as gender, race, and year in college. Binge drinkers were more likely to be male, White and in their fourth year of undergraduate study. Non-binge drinkers were more likely to be female, non-White and in their first year of undergraduate study.

A MANOVA test was completed and results showed a significant difference between alcohol-related personal protective behaviors used by frequent and non-frequent drinkers. ANOVA tests were used to further examine the difference and showed that non-frequent drinkers reported using the following alcohol-related personal protective behaviors more often than frequent drinkers: Determine in advance not to exceed a set number of drinks, choose not to drink alcohol, avoid drinking games, use a designated driver, keep track of how many drinks they were having. A MANOVA test also found significant differences between alcohol-related personal protective behaviors used by binge and non-binge drinkers. ANOVA tests were used to further examine significant differences. Results of the ANOVA analysis showed non-binge drinkers had higher mean personal protective behavior use than binge drinkers for the following alcohol-related personal protective behaviors: Keep track of how many drinks they were having,

pace drinks to one or fewer per hour, avoid drinking games, determine in advance not to exceed a set number of drinks, choose not to drink alcohol drink an alcohol look-alike.

Chi-square tests were performed to determine the relationship between the frequency of self-reported alcohol and alcohol-related health consequences. Results of each chi-square analyses produced significant results showing a significant relationship in drinking frequency and alcohol-related health consequences, with more frequent drinkers self-reporting the following consequences than non-frequent drinkers: Injury of self, injury of another person, fighting, regretful action, forgetting where one was or what one did, being forced to have sex or threat of forced sex, and having unprotected sex. In addition, chi-square tests were performed to determine the relationship binge drinking and self-reported alcohol and alcohol-related health consequences. Results were significant showing a that more binge drinkers self-reporting the following consequences than non-binge drinkers: Injury of self, injury of another person, fighting, regretful action, forgetting where one was or what one did, being forced to have sex or threat of forced sex, and having unprotected sex.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter was to state findings, list conclusions and offer recommendations. The following are findings, conclusions and recommendations derived from the research study.

Findings

Findings communicate the results of a research study. A discussion of research study findings follows.

What is the relationship between the frequency of self-reported alcohol drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?

1. A significant relationship was found between self-reported frequent drinking and self-reported gender of college students in the Southern United States using a *p* value of .05.

2. Significantly more college students in the Southern United States who were male were self-reported as frequent drinkers than was expected.

3. Significantly more college students in the Southern United States who were female were self-reported as non-frequent drinkers than was expected.

4. Significantly fewer college students in the Southern United States who were male were self-reported as non-frequent drinkers than was expected.

5. Significantly fewer college students in the Southern United States who were female were self-reported as frequent drinkers than was expected.

6. A significant relationship was found between self-reported frequency of drinking and self-reported race of college students in the Southern United States using a *p* value of .05.

7. Significantly more college students in the Southern United States who were White were self-reported as frequent drinkers than was expected.

8. Significantly more college students in the Southern United States who were

non-White were self-reported as being non-frequent drinkers than was expected.

9. Significantly fewer college students in the Southern United States who were White were self-reported as non-frequent drinkers than was expected.

10. Significantly fewer college students in the Southern United States who were non-White were self-reported as frequent drinkers than was expected.

11. A significant relationship was found between year in college and the number of college students and self-reported drinking frequency using a *p* value of .05.

12. Significantly more college students in Southern United States who were third year undergraduates were self-reported as frequent drinkers than expected.

13. Significantly more college students in Southern United States who were fourth year undergraduates were self-reported as frequent drinkers than expected.

14. Significantly more college students in Southern United States who were first year undergraduates were self-reported as non-frequent drinkers than expected.

15. Significantly more college students in Southern United States who were second year undergraduates were self-reported as non-frequent drinkers than expected.

16. Significantly fewer college students in Southern United States who were first year undergraduates were self-reported as frequent drinkers than expected.

17. Significantly fewer college students in Southern United States who were second year undergraduates were self-reported as frequent drinkers than expected.

18. Significantly fewer college students in Southern United States who were third year undergraduates were self-reported as non-frequent drinkers than expected.

19. Significantly fewer college students in Southern United States who were fourth year undergraduates were self-reported as non-frequent drinkers than expected.

What is the relationship between the self-reported binge alcohol drinking by college student in the Southern United States and the college student demographic characteristics such as gender, race, and year in school?

1. A significant relationship was found between self-reported binge drinking and self-reported gender of college students in the Southern United States using a *p* value of .05.

2. Significantly fewer college students in the Southern United States who were male were self-reported as binge drinkers than was expected.

3. Significantly fewer college students in the Southern United States who were female were self-reported as non-binge drinkers than was expected.

4. Significantly fewer college students in the Southern United States who were male were self-reported as non-binge drinkers than was expected.

5. Significantly fewer college students in the Southern United States who were female were self-reported as binge drinkers than was expected.

6. A significant relationship was found between self-reported binge drinking and self-reported race of college students in the Southern United States using a *p* value of .05.

7. Significantly more college students in the Southern United States who were White were self-reported as binge drinkers than was expected.

8. Significantly more college students in the Southern United States who were non-White were self-reported as non-binge drinkers than was expected.

9. Significantly fewer college students in the Southern United States who were White were self-reported as non-binge drinkers than was expected.

10. Significantly fewer college students in the Southern United States who were non-White were self-reported as binge drinkers than was expected.

11. A significant relationship was found between year in college and the number of college students and self-reported binge drinking using a *p* value of .05.

12. Significantly more college students in Southern United States who were fourth year undergraduates were self-reported as binge drinkers than expected.

13. Significantly more college students in Southern United States who were

first year undergraduates were self-reported as non-binge drinkers than expected.

14. Significantly fewer college students in Southern United States who were first year undergraduates were self-reported as binge drinkers than expected.

15. Significantly fewer college students in Southern United States who were fourth year undergraduates were self-reported as non-binge drinkers than expected.

Are there significant differences between the frequency of self-reported alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?

1. A significant difference was found between frequent and non-frequent drinkers in their self-reported use of alcohol-related personal protective behaviors using a *p* value of .05.

2. Non-frequent drinkers self-reported using the following alcohol-related personal protective behaviors significantly more often than frequent drinkers: Determine in advance not to exceed a set number of drinks, choose not to drink alcohol, use a designated driver, keep track of how many drinks they were having, and avoid drinking games.

Are there significant differences between self-reported binge alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?

1. A significant difference was found between binge and non-binge drinkers in their self-reported use of alcohol-related personal protective behaviors using a *p* value of .05.

2. Non-binge drinkers self-reported using the following alcohol-related personal protective behaviors significantly more often than binge drinkers: Determine in advance not to exceed a set number of drinks, choose not to drink alcohol, keep track of how many drinks they were having, pace drinks to one or fewer per hour, avoid drinking games, and drink an alcohol look-alike.

What is the relationship between the frequency of self-reported alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?

1. A significant relationship was found between the frequency of alcohol consumption reported by college students in the Southern United States and their self-reported alcohol-related health consequences using a *p* value of .05.

2. Significantly more college students in Southern United States who were frequent drinkers self-reported injuring themselves than expected.

3. Significantly more college students in Southern United States who were non-frequent drinkers self-reported they did not injure themselves than expected.

4. Significantly fewer college students in Southern United States who were frequent drinkers self-reported not injuring themselves than expected.

5. Significantly fewer college students in Southern United States who were non-frequent drinkers self-reported they injured themselves than expected.

6. Significantly more college students in Southern United States who were frequent drinkers self-reported injuring another person than expected.

7. Significantly more college students in Southern United States who were non-frequent drinkers self-reported they did not injure another person than expected.

8. Significantly fewer college students in Southern United States who were frequent drinkers self-reported they had not injured another person than expected.

9. Significantly fewer college students in Southern United States who were non-frequent drinkers self-reported they had injured another person than expected.

10. Significantly more college students in Southern United States who were frequent drinkers self-reported being involved in a fight than expected.

11. Significantly more college students in Southern United States who were non-frequent drinkers self-reported they had not been involved in a fight than expected.

12. Significantly fewer college students in Southern United States who were frequent drinkers self-reported they had not been involved in a fight than expected.

13. Significantly fewer college students in Southern United States who were non-frequent drinkers self-reported being involved in a fight than expected.

14. Significantly more college students in Southern United States who were frequent drinkers self-reported regretful action than expected.

15. Significantly more college students in Southern United States who were non-frequent drinkers self-reported they had no regretful action than expected.

16. Significantly fewer college students in Southern United States who were frequent drinkers self-reported they had no regretful action than expected.

17. Significantly fewer college students in Southern United States who were non-frequent drinkers self-reported regretful action than expected.

18. Significantly more college students in Southern United States who were frequent drinkers self-reported forgetting where they were or what they did than expected.

19. Significantly more college students in Southern United States who were non-frequent drinkers self-reported they did not forget where they were or what they did than expected.

20. Significantly fewer college students in Southern United States who were frequent drinkers self-reported they did not forget where they were or what they did than expected.

21. Significantly fewer college students in Southern United States who were non-frequent drinkers self-reported forgetting where they were or what they did than expected.

22. Significantly more college students in Southern United States who were frequent drinkers self-reported having someone use force or threat of force for sex with them than expected.

23. Significantly more college students in Southern United States who were non-frequent drinkers self-reported they had not had someone use force or threat of force for sex with them than expected.

24. Significantly fewer college students in Southern United States who were frequent drinkers self-reported they had not had someone use force or threat of force for sex with them than expected.

25. Significantly fewer college students in Southern United States who were non-frequent drinkers self-reported having someone use force or threat of force for sex with them than expected.

26. Significantly more college students in Southern United States who were frequent drinkers self-reported having unprotected sex than expected.

27. Significantly more college students in Southern United States who were non-frequent drinkers self-reported they did not have unprotected sex than expected.

28. Significantly fewer college students in Southern United States who were frequent drinkers self-reported they had not had unprotected sex than expected.

29. Significantly fewer college students in Southern United States who were non-frequent drinkers self-reported they had unprotected sex than expected.

What is the relationship between self-reported binge alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?

1. A significant relationship was found between the reported level of binge drinking by college students in the Southern United States and their self-reported alcohol-related health consequences using a *p* value of .05.

2. Significantly more college students in Southern United States who were binge drinkers self-reported injuring themselves than expected.

3. Significantly more college students in Southern United States who were non-binge drinkers self-reported they did not injure themselves than expected.

4. Significantly fewer college students in Southern United States who were binge drinkers self-reported they did not injure themselves than expected.

5. Significantly fewer college students in Southern United States who were non-binge drinkers self-reported they injured themselves than expected.

6. Significantly more college students in Southern United States who were binge drinkers self-reported injuring another person than expected.

7. Significantly more college students in Southern United States who were non-binge drinkers self-reported they did not injure another person than expected.

8. Significantly fewer college students in Southern United States who were binge drinkers self-reported they did not injure another person than expected.

9. Significantly fewer college students in Southern United States who were non-binge drinkers self-reported they injured another person than expected.

10. Significantly more college students in Southern United States who were binge drinkers self-reported being involved in a fight than expected.

11. Significantly more college students in Southern United States who were non-binge drinkers self-reported they had not been involved in a fight than expected.

12. Significantly fewer college students in Southern United States who were binge drinkers self-reported they had not been involved in a fight than expected.

13. Significantly fewer college students in Southern United States who were non-binge drinkers self-reported being involved in a fight than expected.

14. Significantly more college students in Southern United States who were binge drinkers self-reported regretful action than expected.

15. Significantly more college students in Southern United States who were non-binge drinkers self-reported they had no regretful action than expected.

16. Significantly fewer college students in Southern United States who were binge drinkers self-reported they had no regretful action than expected.

17. Significantly fewer college students in Southern United States who were non-binge drinkers self-reported regretful action than expected.

18. Significantly more college students in Southern United States who were binge drinkers self-reported forgetting where they were or what they did than expected.

19. Significantly more college students in Southern United States who were non-binge drinkers self-reported they did not forget where they were or what they did than expected.

20. Significantly fewer college students in Southern United States who were binge drinkers self-reported they did not forget where they were or what they did than expected.

21. Significantly fewer college students in Southern United States who were non-binge drinkers self-reported forgetting where they were or what they did than expected.

22. Significantly more college students in Southern United States who were binge drinkers self-reported someone had used force or threat of force for sex with them than expected.

23. Significantly more college students in Southern United States who were non-binge drinkers self-reported they had not had someone use force or threat of force for sex with them than expected.

24. Significantly fewer college students in Southern United States who were binge drinkers self-reported they had not had someone use force or threat of force for sex with them than expected.

25. Significantly fewer college students in Southern United States who were non-binge drinkers self-reported having someone use force or threat of force for sex with them than expected.

26. Significantly more college students in Southern United States who were binge drinkers self-reported having unprotected sex than expected.

27. Significantly more college students in Southern United States who were non-binge drinkers self-reported they did not have unprotected sex than expected.

28. Significantly fewer college students in Southern United States who were binge drinkers self-reported they did not have unprotected sex than expected.

29. Significantly fewer college students in Southern United States who were non-binge drinkers self-reported reported having unprotected sex than expected.

Conclusions and Recommendations

The research study produced conclusions and recommendations for further research. The following conclusions and recommendations are cited from the research study.

1. Frequent drinkers were more likely to be found to be male, White, and in their third or fourth years of undergraduate study. A non-frequent drinker was more likely to be female, non-White, and in their first or second undergraduate year. These results were similar to the results from the National College Health Risk Behavior Survey (CDC, 1997) that showed significantly more male college students reported current frequent alcohol use than females, and more White students reported current frequent alcohol use than students of other races.

2. Binge drinkers were more likely to be found to be male, White and in their fourth undergraduate year. Non-binge drinkers were more likely to be female,

non-White and in their first year of undergraduate study. Similarly, results from the National College Health Risk Behavior Survey (CDC, 1997) found that that significantly more males and White college students reported current episodic heavy alcohol drinking than females and students of other races.

3. College students enrolled in Southern institutions of higher education that were frequent drinkers reported using specific alcohol-related personal protective behaviors less often than non-frequent drinkers. These alcohol-related personal protective behaviors included determine, in advance, not to exceed a set number of drinks; keep track of how many drinks they were having; avoid drinking games; choose not to drink alcohol; and use a designated driver.

4. College students enrolled in Southern institutions of higher education that were binge drinkers reported using specific alcohol-related personal protective behaviors less often than non-binge drinkers. These alcohol-related personal protective behaviors included determine, in advance, not to exceed a set number of drinks; keep track of how many drinks they were having; avoid drinking games; choose not to drink alcohol; pace drinks to one or fewer per hour; and drink an alcohol-look-alike.

5. College students enrolled in Southern institutions of higher education that were frequent drinkers were more likely to report experiencing specific alcohol-related health consequences than non-frequent drinkers. These alcohol-related health consequences included self injury; injury of another; fighting, regretful action, forgetting where they were or what they did; have someone use threat or force of sex on them; and have unprotected sex. Presley and Pimentel (2006) found that compared to students who were non-heavy and heavy drinkers, students who drank heavily on three or more occasions during one week (heavy drinkers who drank frequently) reported more negative consequences.

6. College students enrolled in Southern institutions of higher education that were binge drinkers were more likely to report experiencing specific alcohol-related health consequences. These alcohol-related health consequences included self injury; injury of another; fighting, regretful action, forgetting where they were or what they did; have someone use threat or force of sex on them; and have unprotected sex. Previous studies by Wechsler, Davenport, Dowdall, Moeykens, and Castillo (1994) as well as Presley and Pimentel (2006) also found that college student binge drinkers, particularly students who binged often, reported experiencing more alcohol-related problems than students who drank less alcohol less often.

7. Programs to reduce frequent drinking and binge drinking should be designed to target male and White upper classmen (third and fourth year undergraduates).

8. Further research investigating more specific demographic information about non-frequent, frequent, non-binge, and binge drinkers should be conducted.

9. Further studies should examine other types of consequences beyond health, such as academic consequences, and whether personal protective behaviors are effective in reducing the risk of such consequences.

10. Further research should rely on actual recording of alcohol consumption, alcohol-related personal protective behaviors health consequences rather than self-reports.

CHAPTER VI

THE RESEARCH STUDY IN RETROSPECT

The purpose of this chapter is to discuss the study in retrospect. Observations about the study, and future research needs are discussed.

Observations About the Research Study

The research study found a significant relationship between the gender, race and year in school with regard to both frequency of drinking and binge drinking. The result was a profile of four types of drinkers. Frequent drinkers were more likely male, White, and in their third or fourth years of undergraduate study. A non-frequent drinker was more likely female, non-White, and in their first or second undergraduate year. Binge drinkers were more likely to be male, White and in their fourth undergraduate year. Non-binge drinkers were more likely to be female, non-White and in their first year of undergraduate study. The profiles may be of use to college health professionals in the south who design education campaigns and interventions as they work to reduce alcohol misuse among college students and to reduce harmful consequences sustained by students and others in their environments.

The study found that non-frequent drinkers reported using alcohol-related personal protective behaviors more often than frequent drinkers. Similarly, non-binge drinkers used alcohol-related personal protective behaviors more than binge drinkers. Future health education initiatives and programming should target the frequent drinkers and binge drinkers in an attempt to encourage these high-risk drinkers to use more alcohol-related personal protective behaviors more often.

Results of the study also showed that more frequent drinkers reported having alcohol-related health consequences than non-frequent drinkers. In addition, more binge drinkers reported experiencing alcohol-related health consequences than non-binge drinkers. These findings show the need to promote the alcohol-related personal protective behaviors among both frequent drinkers and binge drinkers, in hopes that their alcohol-related health consequences will be minimized.

The findings and conclusions of the study are useful in my work with college students. As an assistant professor who teaches liberal studies courses for undergraduate students, it is important for me to not only teach the content of my courses, but to teach students about college life and to teach them about self care for academic and personal success. The conclusions from the research study shows me which students are at risk and what alcohol-related personal protective behaviors they are most likely to use. I can incorporate these findings into my course content and work them into personal conversations when students come to me for help. The study conclusions can aid me as a member of the Western Carolina University wellness council. As a member of the campus wellness council, the conclusions will be useful in designing health promotion events and programs related to alcohol consumption, and alcohol-related personal protective behaviors and health consequences.

Future Research Needs

Future research should continue to identify characteristics of frequent drinkers as well as binge drinkers. In addition, future research should examine other types of consequences, such as academic consequences, and whether personal protective behaviors are effective in reducing risk of such consequences. In addition, further

research should examine actual alcohol consumption, alcohol-related personal protective behaviors health consequences rather than rely on self-reports.

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APPENDICES

APPENDIX A: ACHA-NCHA Data Use Request Form

American College Health Association

ACHA-National College Health Assessment
Data Use Request Form

Date submitted: 8/21/08 Date needed*: 9/04/08

**Must allow at least 2 weeks for processing*

***Section 1.* Requestor (Principal Investigator) Information:**

Name: April Tallant

Title: Doctoral Candidate, University of Tennessee, Knoxville

Organization: University of Tennessee, Knoxville
Has this organization ever conducted the ACHA-NCHA?
No _X not that I know of Yes ____ Survey period(s)
_____

Street Address: 1298 Long Branch Road

City: Robbinsville State: NC Zip: 28771

Phone: 828-479-2350 Fax: 828-479-6747

E-mail Address: atallant@utk.edu

ACHA Membership: *Individual* __X__ *Institutional* ____ *Non-Member* ____ *Unsure* ____

***Section 2.* Co-Principal Investigator(s) Information:**

Name(s): Dr. Susan Smith(Dissertation Chairperson)

Title(s): Director, Health and Safety Programs

Organization: University of Tennessee, Knoxville

Street Address: 390 Health, Physical Education, And Recreation Building
1914 Andy Holt Avenue
City: Knoxville State: TN Zip: 37996-2710

Phone: 865-974-1108 Fax: 865-974-6439

E-mail Address: smsmith@utk.edu

ACHA Membership: *Individual* ____ *Institutional* ____ *Non-Member* ____ *Unsure* __X__

Section 3. **Other individual(s) who will be assisting in this research:**
(*please append additional sheets if necessary*)

Name: Dr. Gregory Petty

Title: Professor

Organization: University of Tennessee, Knoxville

Name: Dr. June Gorski

Title: Professor

Organization: University of Tennessee, Knoxville

Name: Dr. Ernest Brewer

Title: Professor/Principal Investigator and Director of Federal Programs

Organization: University of Tennessee, Knoxville

Name: _____

Title: _____

Organization: _____

Name: _____

Title: _____

Organization: _____

Name: _____

Title: _____

Organization: _____

Section 4. **Research Project Information**

Project title:

Protective Behaviors Used and Consequences Experienced By Southern U.S. Undergraduate College Students Who Report Either Frequent Or Binge Alcohol Use

Project purpose:

The purpose of this research study is to examine the alcohol-related personal protective behaviors used and alcohol-related health consequences experienced by Southern U.S. undergraduate college students who report either frequent or binge alcohol use behaviors.

Hypotheses to be tested:

1. What is the relationship between the frequency of self-reported alcohol drinking by college students in the Southern United States and the college student demographic characteristics such as gender, race, and year in college?
2. What is the relationship between the self-reported binge alcohol drinking by college student in the Southern United States and the college student demographic characteristics such as gender, race, and year in college?
3. What is the relationship between the frequency of self-reported alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?
4. What is the relationship between self-reported binge alcohol drinking and alcohol-related personal protective behaviors as reported by college students in the Southern United States?
5. What is the relationship between the frequency of self-reported alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?
6. What is the relationship between self-reported binge alcohol drinking and alcohol-related health consequences as reported by college students in the Southern United States?

***Section 5.* Data Requested and Proposed Analyses**

ACHA-NCHA survey time period(s) requested:
Spring 2006 Fall 20_____

Survey item(s) requested (Q1-Q58). *Check all that apply.**
A sample survey can be found at: http://www.acha.org/projects_programs/sample_ncha.pdf

Q1		Q16	x	Q31		Q45	
Q2		Q17		Q32		Q46	x
Q3		Q18		Q33		Q47	
Q4		Q19		Q34		Q48	
Q5		Q20		Q35		Q49	x
Q6		Q21		Q36		Q50	
Q7		Q22		Q37		Q51	x
Q8		Q23		Q38		Q52	
Q9	x	Q24		Q39		Q53	
Q10		Q25		Q40		Q54	
Q11		Q26		Q41		Q55	
Q12	x	Q27		Q42		Q56	
Q13	x	Q28		Q43A†		Q57	
Q14	x	Q29		Q43B†		Q58	
Q15		Q30		Q44			

**Complete datasets will not be provided*
†*Q43A asks students about conditions in the last school year; Q43B asks students about whether they have ever been diagnosed with a particular condition.*

Analyses Plans:

Chi-square tests will be used to examine the relationship between frequency of alcohol drinking and student gender, race and year in college; to examine the relationship between binge alcohol drinking and student gender, race and year in college; to examine the relationship between frequency of drinking and self-reported health consequences; and to examine the relationship between alcohol-related health consequences reported by students who report binge-drinking behaviors.

Multivariate analysis of variance (MANOVA) will be used to examine the relationship of the frequency of student alcohol use and personal protective behaviors practiced among college students. MANOVA will also be used to examine the relationship between the self-reported binge drinking and alcohol-related personal protective behaviors reported by college students.

***Section 6.* Intended Dissemination of Results**

How will the results of this research be used/disseminated? (check all that apply)

__x__ Journal Article(s)

List journal(s) I am not sure, but I would like to publish an article in JACH.

____ Book Chapter(s)
List book(s) _____

____ Professional organization presentation(s)
List organization(s) _____

_x___ Thesis/Dissertation
Name of primary advisor Dr. Susan Smith

____ Fact Sheet/Brochure

____ Policy Development

____ Educational Programming Development/Implementation

____ Comparison to individual institution's results

____ Other
Please List _____

Section 7. **Data Use Guidelines**

The ACHA-NCHA data contain information about high-risk behaviors, and all data are confidential. ACHA will not release data on any institution, nor will it release data sets where it is possible to identify any participating schools. Individuals who are granted access to any ACHA-NCHA data must adhere to ACHA's data use guidelines, which are provided in Section 8. Failure to sign or to adhere to the attached agreement will result in immediate termination of data use privileges.

The accuracy of the users' statistical analyses and the findings they report are not the responsibility of the American College Health Association. ACHA shall not be held liable for improper or incorrect use of the data.

Section 8. **Data Use Agreement**

Signing this agreement does not guarantee your request will be approved; however, this section must be complete for your application to be considered.

By signing below, I agree to the following:

- I will reference the American College Health Association when reporting any data obtained from the ACHA-NCHA utilizing the following standard format (items in Arial font are specific to the data you receive and must be completed appropriately):
  American College Health Association. American College Health Association-National College Health Assessment, Survey Period(s) [computer file]. Baltimore, MD: American College Health Association [producer and distributor]; (YYYY-MM-DD of distribution).
- I will grant access to ACHA-NCHA data to only those individuals specified in this *Data Use Request Form*. Should the need to grant access to additional individuals arise, I will contact the ACHA Research Director immediately.
- If my institution requires, I will obtain all necessary Institutional Review Board (IRB) approval for secondary data analysis prior to beginning my research, and I will provide ACHA with appropriate documentation of IRB approval.
- I will provide ACHA with any final products produced using ACHA-NCHA data, which include but are not limited to: professional journal manuscripts, professional conference presentations, student theses/dissertations, book chapters, policy documents, fact sheets, and brochures.

April C Gallant — Signature of Principal Investigator — Date 08/21/08

Susan M Smith — Signature of Co-Principal Investigator(s) — Date 9/02/08

When all sections are complete, please either mail or fax this form to:

American College Health Association

P.O. Box 28937
Baltimore, MD 21240
410.859.1510 (fax)

Direct all inquiries regarding completion of this form to:

E. Victor Leino, Ph.D.
ACHA Research Director
410.859.1500 (phone)
evl@acha.org

For Official Use Only

Approved _____ Not Approved _____ Date _____

APPENDIX B: ACHA Approval Letter

American College Health Association

P.O. Box 28937
Baltimore, MD 21240-8937
Tel: (410) 859-1500
Fax: (410) 859-1510
www.acha.org

September 30, 2008

April C Tallant
1298 Long Branch Road
Robbinsville, NC 28771

Dear April,

Thank you for submitting a request to utilize the Spring 2006 ACHA-NCHA data in your study, "Protective Behaviors Use and Consequences Experienced by Southern US Undergraduate College Students Who Report Either Frequent or Binge Alcohol Use." Your request has been approved.

I have enclosed a copy of our data use guidelines and agreement for your information. Your signed copy is on file in my office.

As stated in the agreement, we would appreciate a copy of any final products that result from your research.

Please don't hesitate to contact me if you have any questions.

Best of luck in your efforts,

Mary Hoban, PhD, CHES
Director, ACHA-NCHA Program Office

Enclosure: ACHA-NCHA Data Use Guidelines and Agreement

Data Use Guidelines

The ACHA-NCHA data contain information about high-risk behaviors, and all data are confidential. ACHA will not release data on any institution, nor will it release data sets where it is possible to identify any participating schools. Individuals who are granted access to any ACHA-NCHA data must adhere to ACHA's data use guidelines, which follow. Failure to sign or to adhere to the attached agreement will result in immediate termination of data use privileges.

The accuracy of the users' statistical analyses and the findings they report are not the responsibility of the American College Health Association. ACHA shall not be held liable for improper or incorrect use of the data.

Data Use Agreement

Signing this agreement does not guarantee your request will be approved; however, this section must be complete for your application to be considered.

By signing below, I agree to the following:

- I will reference the American College Health Association when reporting any data obtained from the ACHA-NCHA utilizing the following standard format (items in Arial font are specific to the data you receive and must be completed appropriately):
  American College Health Association. American College Health Association-National College Health Assessment, Survey Period(s) [computer file]. Baltimore, MD: American College Health Association [producer and distributor]; (YYYY-MM-DD of distribution).
- I will grant access to ACHA-NCHA data to only those individuals specified in this *Data Use Request Form*. Should the need to grant access to additional individuals arise, I will contact the ACHA Research Director immediately.
- If my institution requires, I will obtain all necessary Institutional Review Board (IRB) approval for secondary data analysis prior to beginning my research, and I will provide ACHA with appropriate documentation of IRB approval.
- I will provide ACHA with any final products produced using ACHA-NCHA data, which include but are not limited to: professional journal manuscripts, professional conference presentations, student theses/dissertations, book chapters, policy documents, fact sheets, and brochures.

Signed copy on file at ACHA, 08/21/2008

APPENDIX C: Permission to Include the NCHA Instrument in the Appendix

August 19, 2008

PO BOX 1395
Robbinsville, NC 28771

Mary Hoban, PhD, CHES
Director, ACHA-NCHA Program
ACHA-NCHA Program Office
P.O. Box 28937
Baltimore, MD 21240-8937

Dear Mary:

As you know, I am completing a doctoral dissertation at the University of Tennessee at Knoxville. My dissertation, entitled "Protective Behaviors Used and Consequences Experienced By Southern U.S. Undergraduate College Students Who Report Either Frequent Or Binge Alcohol Use," is a secondary analysis of Spring 2006 NCHA data.

I am requesting your permission to include a sample copy of the ACHA-NCHA instrument in the appendix of my dissertation.

If this request meets your approval, please sign this letter below and return to me in the enclosed return envelope. Thank you.

Sincerely,

April C. Tallant
Doctoral Candidate
University of Tennessee at Knoxville

Permission Granted for the Request Above:

Mary Hoban, PhD, CHES
Director, ACHA-NCHA Program

9/19/08
Date

APPENDIX D: NCHA Instrument

American College Health Association

National College Health Assessment

Instructions:

The following questions ask about various aspects of your health.

To answer the questions, fill in the oval that corresponds to your response.

Select only one response unless instructed otherwise.

Use a No. 2 pencil or blue or black ink pen only. Do not use pens with ink that soaks through the paper. CORRECT: ● INCORRECT: ✓ ✗ ◒ ⊙

This survey is completely voluntary. You may choose not to participate or not to answer any specific question. You may skip any question you are not comfortable in answering.

This survey is completely anonymous. Please make no marks of any kind on the survey which could identify you individually.

Composite data will then be shared with your campus for use in health promotion activities.

Thank you for taking the time and thought to complete this survey. We appreciate your participation!

PAGE ONE

PLEASE DO NOT WRITE IN THIS AREA

SERIAL #

Mark Reflex® forms by NCS Pearson EM-247487-1:654321 Printed in U.S.A.

The first 8 questions ask about health, health education, and safety.

1. Considering your age, how would you describe your general health?
   ○ Excellent ○ Very good ○ Good ○ Fair ○ Poor ○ Don't know

2. On which of the following health topics have you ever received information from your college or university? (Select all that apply)
   - ○ Tobacco use prevention
   - ○ Alcohol and other drug use prevention
   - ○ Sexual assault/relationship violence prevention
   - ○ Violence prevention
   - ○ Injury prevention and safety
   - ○ Suicide prevention
   - ○ Pregnancy prevention
   - ○ AIDS or HIV infection prevention
   - ○ Sexually transmitted disease (STD) prevention
   - ○ Dietary behaviors and nutrition
   - ○ Physical activity and fitness
   - ○ None of the above

(Please mark the best response for each question to the right)	3. Use the scale below to record the BELIEVABILITY of each source of health information. Believable	Neither Believable nor Unbelievable	Unbelievable	4. Do you usually get health-related information from any of the following sources? No	Yes
Leaflets, pamphlets, flyers	○	○	○	○	○
Campus newspaper articles	○	○	○	○	○
Health center medical staff	○	○	○	○	○
Health educators	○	○	○	○	○
Friends	○	○	○	○	○
Resident assistants/advisors	○	○	○	○	○
Parents	○	○	○	○	○
Religious center	○	○	○	○	○
Television	○	○	○	○	○
Magazines	○	○	○	○	○
Campus peer educators	○	○	○	○	○
Faculty/coursework	○	○	○	○	○
Internet/world wide web	○	○	○	○	○
Other: (please specify) _____	○	○	○	○	○

5. Within the **last school year**, how often did you: (Please mark the appropriate column for each row)	Always	Most of the time	Sometimes	Rarely	Never	N/A didn't do this within the last school year
Wear a seatbelt when you rode in a car?	○	○	○	○	○	○
Wear a helmet when you rode a bicycle?	○	○	○	○	○	○
Wear a helmet when you rode a motorcycle?	○	○	○	○	○	○
Wear a helmet when you were inline skating?	○	○	○	○	○	○

6. Within the **last school year**, were you:	Yes	No
In a physical fight?	○	○
Physically assaulted (do not include sexual assault)?	○	○

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	Yes	No
7. Within the **last school year**, have you experienced:		
Verbal threats for sex against your will?	○	○
Sexual touching against your will?	○	○
Attempted sexual penetration (vaginal, anal, oral intercourse) against your will?	○	○
Sexual penetration (vaginal, anal, oral intercourse) against your will?	○	○
8. Within the **last school year**, have you been in a relationship that was:		
Emotionally abusive?	○	○
Physically abusive?	○	○
Sexually abusive?	○	○

The next 11 questions ask about alcohol, tobacco, and drugs.

9. Within the **last 30 days**, on how many days did you use: (Mark one for each row)	Never used	Have used, but not in last 30 days	1-2 days	3-5 days	6-9 days	10-19 days	20-29 days	All 30 days
Cigarettes	○	○	○	○	○	○	○	○
Cigars	○	○	○	○	○	○	○	○
Smokeless tobacco	○	○	○	○	○	○	○	○
Alcohol (beer, wine, liquor)	○	○	○	○	○	○	○	○
Marijuana (pot, hash, hash oil)	○	○	○	○	○	○	○	○
Cocaine (crack, rock, freebase)	○	○	○	○	○	○	○	○
Amphetamines (diet pills, speed, meth, crank)	○	○	○	○	○	○	○	○
Rohypnol (roofies), GHB or Liquid X (intentional use)	○	○	○	○	○	○	○	○
Other drugs	○	○	○	○	○	○	○	○

10. Within the **last 30 days**, how often do you think the typical student at your school used: State your best estimate. (Mark one for each row)	Never used	One or more days	Used daily
Cigarettes	○	○	○
Cigars	○	○	○
Smokeless tobacco	○	○	○
Alcohol (beer, wine, liquor)	○	○	○
Marijuana (pot, hash, hash oil)	○	○	○
Cocaine (crack, rock, freebase)	○	○	○
Amphetamines (diet pills, speed, meth, crank)	○	○	○
Rohypnol (roofies), GHB or Liquid X (intentional use)	○	○	○
Other drugs	○	○	○

One drink or alcoholic beverage is defined as a 12 oz. beer, a 4 oz. glass of wine, a shot of liquor, or a mixed drink.

11. Within the **last 30 days**, did you: (Mark one for each row)	Not applicable/Don't drive	Not applicable/Don't drink	No	Yes
Drive after drinking any alcohol at all	○	○	○	○
Drive after having 5 or more drinks	○	○	○	○

12. The last time you "partied"/socialized, how many **hours** did you drink alcohol? State your best estimate. (If less than 10, code answers as 00, 01, 02, etc.)

HOURS: 00 01 02 03 04 05 06 07 08 09

13. The last time you "partied"/socialized, how many alcoholic **drinks** did you have? State your best estimate. (If less than 10, code answers as 00, 01, 02, etc.)

DRINKS: 00 01 02 03 04 05 06 07 08 09

PAGE THREE

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14. In the **last two weeks**, on how many occasions did you drink the same or more alcohol as indicated in item #13? State your best estimate. (If less than 10, code answers as 00, 01, 02, etc.)

TIMES

15. How many alcoholic **drinks** do you think **the typical student at your school** had the last time he/she "partied"/socialized? (If less than 10, code answers as 00, 01, 02, etc.)

DRINKS

16. Think back over the **last two weeks**. How many times, if any, have you had five or more alcoholic drinks at a sitting?

○ None ○ 1 time ○ 2 times ○ 3 times ○ 4 times ○ 5 times ○ 6 times ○ 7 times ○ 8 times ○ 9 or more times

(Please mark the appropriate column for each row)

17. During the **last school year**, if you "partied"/socialized, how often did you...

	Always	Usually	Sometimes	Rarely	Never	Not applicable/Don't drink
Alternate non-alcoholic with alcoholic beverages	○	○	○	○	○	○
Determine, in advance, not to exceed a set number of drinks	○	○	○	○	○	○
Choose not to drink alcohol	○	○	○	○	○	○
Use a designated driver	○	○	○	○	○	○
Eat before and/or during drinking	○	○	○	○	○	○
Have a friend let you know when you've had enough	○	○	○	○	○	○
Keep track of how many drinks you were having	○	○	○	○	○	○
Pace your drinks to 1 or fewer per hour	○	○	○	○	○	○
Avoid drinking games	○	○	○	○	○	○
Drink an alcohol look-alike (non-alcoholic beer, punch etc.)	○	○	○	○	○	○

(Please mark the appropriate column for each row)

18. If you drink alcohol, within the **last school year**, have you experienced any of the following **as a consequence of your drinking**?

	Yes	No	Not applicable/Don't drink
Physically injured yourself	○	○	○
Physically injured another person	○	○	○
Been involved in a fight	○	○	○
Did something you later regretted	○	○	○
Forgot where you were or what you did	○	○	○
Had someone use force or threat of force to have sex with you	○	○	○
Had unprotected sex	○	○	○

19. Within the **last 30 days**, what **percent** of students at your school used? State your best estimate.

% Used Cigarettes

% Used Alcohol

% Used Rohypnol or GHB

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PAGE FOUR

The next 11 questions ask about sex behavior, perceptions, and contraception.

20. Within the **last school year**, with how many partners, if any, have you had sex (oral, vaginal, or anal)? (If less than 10, code answers as 00, 01, 02, etc.) → PARTNERS

21. Within **last school year**, were your sexual partner(s), if any,
○ N/A ○ Female
○ Male ○ Both Male and Female

22. Within the **last school year**, with how many partners do you think **the typical student at your school** has had sex (oral, vaginal, or anal)? (If less than 10, code answers as 00, 01, 02, etc.) → PARTNERS

(Please mark the appropriate column for each row)

23. Within the **last 30 days**, if you are sexually active, how many times did you have:	Have not done this during **last 30 days** / Never did this sexual activity	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Oral sex?	○	○	○	○	○	○	○
Vaginal Intercourse?	○	○	○	○	○	○	○
Anal Intercourse?	○	○	○	○	○	○	○

(Please mark the appropriate column for each row)

24. How many times within the **last 30 days** do you think **the typical student at your school** has had:	0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Oral sex?	○	○	○	○	○	○	○
Vaginal Intercourse?	○	○	○	○	○	○	○
Anal Intercourse?	○	○	○	○	○	○	○

(Please mark the appropriate column for each row)

25. Within the **last 30 days**, if you are sexually active, how often did you or your partner(s) use a condom during:	Have not done this during **last 30 days** / Never did this sexual activity	Never	Rarely	Sometimes	Mostly	Always
Oral sex?	○	○	○	○	○	○
Vaginal Intercourse?	○	○	○	○	○	○
Anal Intercourse?	○	○	○	○	○	○

CONDOM USE

(Please mark the appropriate column for each row)

26. Within the **last 30 days**, how often do you think **the typical student at your school** has used a condom during:	The typical student at my school does not participate in this sexual activity	Never	Rarely	Sometimes	Mostly	Always
Oral sex?	○	○	○	○	○	○
Vaginal Intercourse?	○	○	○	○	○	○
Anal Intercourse?	○	○	○	○	○	○

CONDOM USE

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(Please mark the appropriate column for each row)

27. If you are sexually active, did you use a condom the last time you had:

	No	Yes	Never did this sexual activity	Don't know/Don't remember
Oral sex?	○	○	○	○
Vaginal Intercourse?	○	○	○	○
Anal Intercourse?	○	○	○	○

28. If you have had vaginal intercourse, what method did you or your partner use to prevent pregnancy the last time? (Select all that apply)

- ○ Have not had vaginal intercourse
- ○ Birth control pills
- ○ Depo Provera (shots)
- ○ Norplant (implant)
- ○ Condoms (male or female)
- ○ Diaphragm/Cervical cap/Sponge
- ○ Spermicide (e.g. foam)
- ○ Fertility awareness (calendar, mucous, basal body temperature)
- ○ Withdrawal
- ○ Other method
- ○ Nothing

29. Within the **last school year**, if you are sexually active, have you or your partner(s) used emergency contraception ("morning after pill")?

○ No ○ Yes ○ Don't know ○ Not sexually active

30. Within the **last school year**, have you **unintentionally** become pregnant or gotten someone else pregnant?

- ○ Have not had vaginal intercourse within the last school year.
- ○ No
- ○ Yes
- ○ Don't know

31. Have you ever been tested for HIV infection?

○ No ○ Yes ○ Don't know

32. Which of the following best describes you?

○ Heterosexual ○ Bisexual ○ Unsure
○ Gay/Lesbian ○ Transgendered

33. If you have a credit card(s) how much total credit card debt did you carry last month? That is, what was the total unpaid balance on all of your credit cards (that **you** are responsible for paying)?

- ○ None, I don't have any credit cards/I'm not responsible for paying
- ○ None, I pay the full amount each month
- ○ $1 - $99
- ○ $100 - $249
- ○ $250 - $499
- ○ $500 - $999
- ○ $1,000 - $1,999
- ○ $2,000 - $2,999
- ○ $3,000 - $3,999
- ○ $4,000 - $4,999
- ○ $5,000 - $5,999
- ○ $6,000 or more

34. What is your approximate cumulative grade average?

○ A ○ B ○ C ○ D/F ○ N/A

The next 5 questions ask about weight, nutrition, and exercise.

35. How do you describe your weight?

- ○ Very underweight
- ○ Slightly underweight
- ○ About the right weight
- ○ Slightly overweight
- ○ Very overweight

36. Are you trying to do any of the following about your weight?

- ○ I am not trying to do anything about my weight
- ○ Stay the same weight
- ○ Lose weight
- ○ Gain weight

37. Within the **last 30 days**, did you do any of the following? (Select all that apply)

- ○ Exercise to lose weight
- ○ Diet to lose weight
- ○ Vomit or take laxatives to lose weight
- ○ Take diet pills to lose weight
- ○ I didn't do any of the above

38. How many servings of fruits and vegetables do you usually have **per day** (1 serving = 1 medium piece of fruit, 1/2 cup chopped, cooked or canned fruits/vegetables, 3/4 cup fruit/vegetable juice, small bowl of salad greens, or 1/2 cup dried fruit)?

- ○ I don't eat fruits and vegetables
- ○ 1-2
- ○ 3-4
- ○ 5 or more

(Please mark the appropriate column for each row)

39. On how many of the **past 7 days** did you:

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Participate in vigorous exercise for at least 20 minutes or moderate exercise for at least 30 minutes?	○	○	○	○	○	○	○	○
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	○	○	○	○	○	○	○	○
Get enough sleep so that you felt rested when you woke up in the morning?	○	○	○	○	○	○	○	○

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The next 4 questions ask about mental and physical health.

40. (Please mark the appropriate column for each row) Within the **last school year** how many times have you:

	Never	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Felt things were hopeless	○	○	○	○	○	○	○
Felt overwhelmed by all you had to do	○	○	○	○	○	○	○
Felt exhausted (not from physical activity)	○	○	○	○	○	○	○
Felt very sad	○	○	○	○	○	○	○
Felt so depressed that it was difficult to function	○	○	○	○	○	○	○
Seriously considered attempting suicide	○	○	○	○	○	○	○
Attempted suicide	○	○	○	○	○	○	○

41. Have you ever been diagnosed with depression?

○ Yes ○ No

(If you responded "no," please go to question 42)

	Yes	No
If Yes: Have you been diagnosed with depression within the last school year?	○	○
Are you currently in therapy for depression?	○	○
Are you currently taking medication for depression?	○	○

42. (Please mark the appropriate column for each row) Have you:

	Yes	No	Don't Know
Been vaccinated against hepatitis B?	○	○	○
Been vaccinated against meningococcal disease (meningococcal meningitis)?	○	○	○
Been vaccinated against varicella (chicken pox)?	○	○	○
Been vaccinated with measles, mumps, rubella (2 shots)?	○	○	○
Been vaccinated against influenza (the flu) in the last year?	○	○	○
Had a dental exam and cleaning in the last year?	○	○	○
(Males) Performed testicular self exam in the last month?	○	○	○
(Females) Performed breast self exam in the last month?	○	○	○
(Females) Had a routine gynecological exam in the last year?	○	○	○
Had your blood pressure checked in the last 2 years?	○	○	○
Had your cholesterol checked in the last 5 years?	○	○	○
Used sunscreen daily?	○	○	○

43. (Please make two marks in the appropriate columns for each row)

	Have you **ever** been diagnosed with any of the following? Yes	Have you **ever** been diagnosed with any of the following? No	Within the last school year, have you had any of the following? Yes	Within the last school year, have you had any of the following? No
Allergy problems	○	○	○	○
Anorexia	○	○	○	○
Anxiety Disorder	○	○	○	○
Asthma	○	○	○	○
Bulimia	○	○	○	○
Chronic Fatigue Syndrome	○	○	○	○
Depression	○	○	○	○
Diabetes	○	○	○	○
Endometriosis	○	○	○	○
Genital herpes	○	○	○	○
Genital warts/HPV	○	○	○	○
Hepatitis B or C	○	○	○	○
High blood pressure	○	○	○	○
High cholesterol	○	○	○	○
HIV infection	○	○	○	○
Repetitive stress injury (e.g. carpal tunnel syndrome)	○	○	○	○
Seasonal Affective Disorder	○	○	○	○
Substance abuse problem	○	○	○	○
Back pain	○	○	○	○
Broken bone/fracture	○	○	○	○
Bronchitis	○	○	○	○
Chlamydia	○	○	○	○
Ear infection	○	○	○	○
Gonorrhea	○	○	○	○
Mononucleosis	○	○	○	○
Pelvic Inflammatory Disease	○	○	○	○
Sinus infection	○	○	○	○
Strep throat	○	○	○	○
Tuberculosis	○	○	○	○

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The next question asks about impediments to academic performance.

44. Within the **last school year**, have any of the following affected your academic performance? (Please select the most serious outcome for each item below)

	Received an incomplete or dropped the course	Received a lower grade in the course	Received a lower grade on an exam or important project	I have experienced this issue but my academics have not been affected	This did not happen to me/not applicable
Alcohol use	○	○	○	○	○
Allergies	○	○	○	○	○
Assault (physical)	○	○	○	○	○
Assault (sexual)	○	○	○	○	○
Attention Deficit Disorder	○	○	○	○	○
Cold/Flu/Sore throat	○	○	○	○	○
Concern for a troubled friend or family member	○	○	○	○	○
Chronic illness (diabetes, asthma, etc.)	○	○	○	○	○
Chronic pain	○	○	○	○	○
Death of a friend or family member	○	○	○	○	○
Depression/Anxiety Disorder/ Seasonal Affective Disorder	○	○	○	○	○
Drug use	○	○	○	○	○
Eating disorder/problem	○	○	○	○	○
HIV Infection	○	○	○	○	○
Injury	○	○	○	○	○
Internet use/computer games	○	○	○	○	○
Learning disability	○	○	○	○	○
Mononucleosis	○	○	○	○	○
Pregnancy (yours or your partner's)	○	○	○	○	○
Relationship difficulty	○	○	○	○	○
Sexually transmitted disease	○	○	○	○	○
Sinus infection/ear infection/bronchitis/strep throat	○	○	○	○	○
Sleep difficulties	○	○	○	○	○
Stress	○	○	○	○	○
Other _____	○	○	○	○	○

The last questions ask about demographic characteristics.

45. How old are you? Years

46. What is your sex?
- ○ Female
- ○ Male

47. What is your height in feet and inches? HEIGHT Ft. Inch

48. What is your weight in pounds? WEIGHT Pounds

49. Year in school:
- ○ 1st year undergraduate
- ○ 2nd year undergraduate
- ○ 3rd year undergraduate
- ○ 4th year undergraduate
- ○ 5th year or more undergraduate
- ○ Graduate or professional
- ○ Adult special
- ○ Other

50. Are you a full-time student?
○ Yes ○ No

51. How do you usually describe yourself? (Mark all that apply)
- ○ White - not Hispanic (includes Middle Eastern)
- ○ Black - not Hispanic
- ○ Hispanic or Latino
- ○ Asian or Pacific Islander
- ○ American Indian or Alaskan Native
- ○ Other

52. Are you an international student? ○ Yes ○ No

53. What is your current relationship status?
- ○ Single
- ○ Married/domestic partner
- ○ Engaged or committed dating relationship
- ○ Separated
- ○ Divorced
- ○ Widowed

54. Where do you currently live?
- ○ Campus residence hall
- ○ Fraternity or sorority house
- ○ Other university/college housing
- ○ Off-campus housing
- ○ Parent/guardian's home
- ○ Other

55. Are you a member of a social fraternity or sorority? (National Interfraternity Conference, National Panhellenic Conference, or National Pan-Hellenic Council)
○ Yes ○ No

56. How many hours a week do you **work for pay**?
- ○ 0 hours
- ○ 1-9 hours
- ○ 10-19 hours
- ○ 20-29 hours
- ○ 30-39 hours
- ○ 40 hours
- ○ more than 40 hours

57. How many hours a week do you **volunteer**?
- ○ 0 hours
- ○ 1-9 hours
- ○ 10-19 hours
- ○ 20-29 hours
- ○ 30-39 hours
- ○ 40 hours
- ○ more than 40 hours

58. Do you have **any kind** of health insurance (including prepaid plans such as HMOs - health maintenance organizations)?
○ Yes ○ No ○ Not sure

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THANK YOU FOR COMPLETING THIS SURVEY

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VITA

April Conley Tallant was born on April 22, 1974 and grew up in Andrews, North Carolina. She graduated from Andrews High School in 1992, and earned a Bachelor of Science in Home Economics from Western Carolina University in 1996. She began working with the North Carolina Cooperative Extension Service in Cherokee County as the Family and Consumer Education Agent in 1997, working there for over four years while working on a Master of Health Sciences degree from Western Carolina University. She completed a dietetic internship and passed the registration examination to become a registered dietitian in 1999. She earned her MHS in 2001, and took a position with the Cherokee County School System as Even Start Family Literacy Program Coordinator. In 2003, April took a lecturer position at Western Carolina University and began working on her doctorate degree. April is currently an assistant professor at Western Carolina. She teaches in the Liberal Studies and Nutrition and Dietetic Programs. April is married to Mack D. Tallant, attorney, employed at McKinney and Tallant, P.A. They have one son, Jackson. They live in Robbinsville NC.